



**Building
Partnerships**

Fibreplus Ltd.

Telecommunications College

MOD Resettlement Options

City & Guilds & BTEC Courses

3667-02 Level 2 Award in Communication Cabling

3667-03 Level 3 Certificate in Designing & Planning Communication Networks

2377 Level 3 Certificates for the Code of Practice for In-Service Inspection & Testing of Electrical Equipment

7540-12 Level 2 Award in ICT Principles for Apprentices

7540-13 Level 3 Certificate in ICT Principles for Advanced Apprentices

BTEC Level 3 Advanced Award in Fibre Optic Test & Measurement

Fujikura Accredited and Specialist Courses

Advanced Test & Measurement

Fujikura First Line Field Maintenance Engineer (FFME)

Fibre Optic Installation & Testing. Single & Multimode, Internal/External

Fibre & Copper Job Costing & Design

VOIP and the 3CX PBX System

FTTx, Fibre to the Home with Intelligent Home Installation & Testing



The Qualifications and Credit Framework

QCF

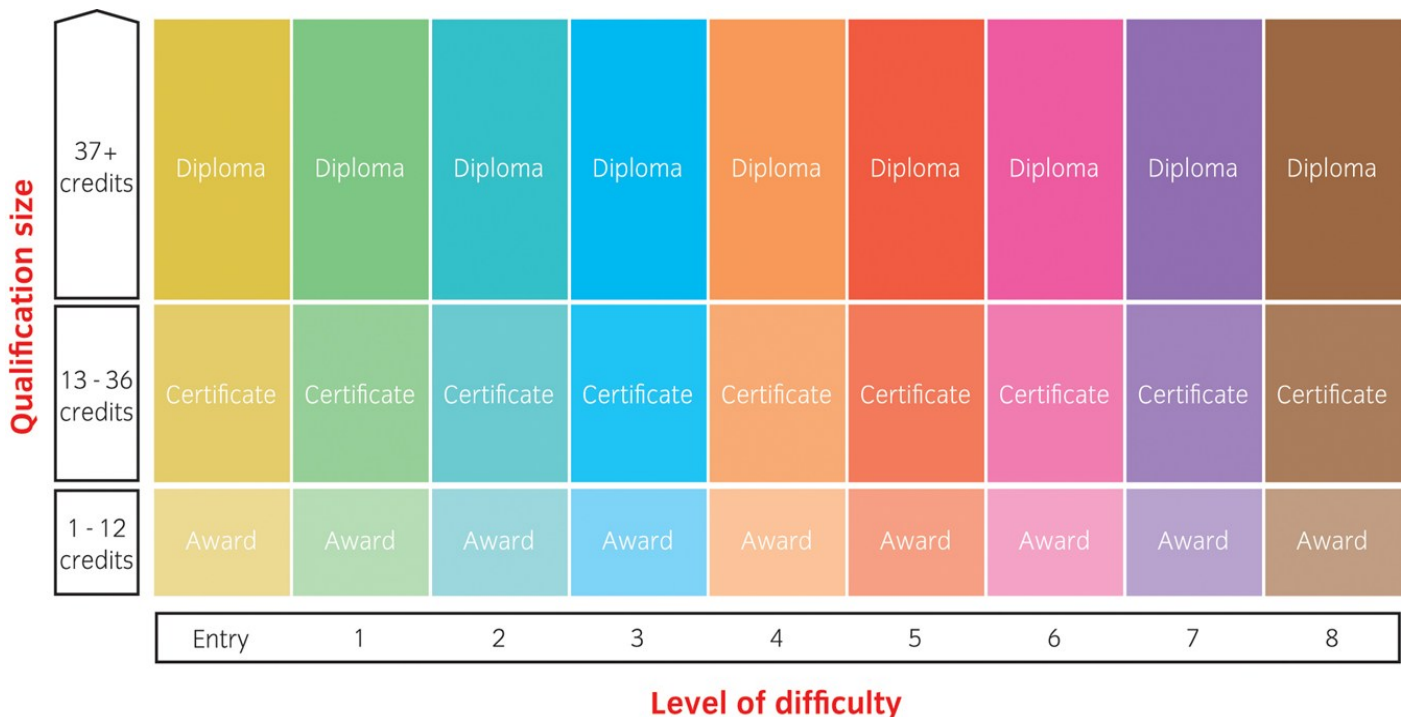
What is QCF?

- QCF is the new Government framework for recognising achievement, through the award of credit, for units and qualifications.
- It provides more flexible routes to full qualifications, achievable in smaller steps.
- New standardised titles have been introduced which will make vocational qualifications easier to understand.

How does QCF work?

A QCF qualification is made up of manageable 'chunks' of learning. Credit is awarded on the completion of a unit with the required credits in a qualification being set out by the rules of combination. Progression is assisted by the accumulation and transfer of credit(s). This allows for more flexible career pathways, with reduced repetition, as learners can build on previously banked credit as they move through the levels of qualification.

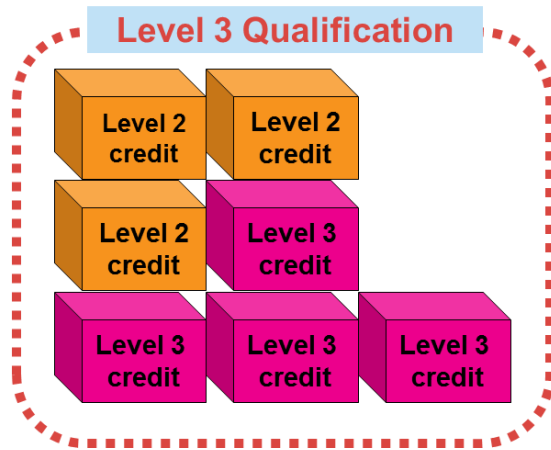
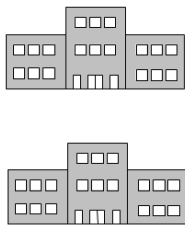
- All units in the QCF use the same unit template, consisting of the learning outcomes (what a learner needs to know, understand or do) and the assessment criteria (which specify if the learner has met the outcomes to a defined level).
- A credit value and level are assigned to every unit. The credit value is a measure of average time, where one credit equals 10 hours of notional learning. Many units still include guided learning hours too.
- Some units appear in more than one qualification and the credit can be transferred between qualifications, as long as it forms part of the 'rules of combination'.



1 credit = 10 hours of learning. The learning time is notional and is taken as the estimated number of hours it takes the average learner to complete all the learning outcomes of that unit

Course Progression and Transferal of Credits

Provider
Fibreplus Ltd.

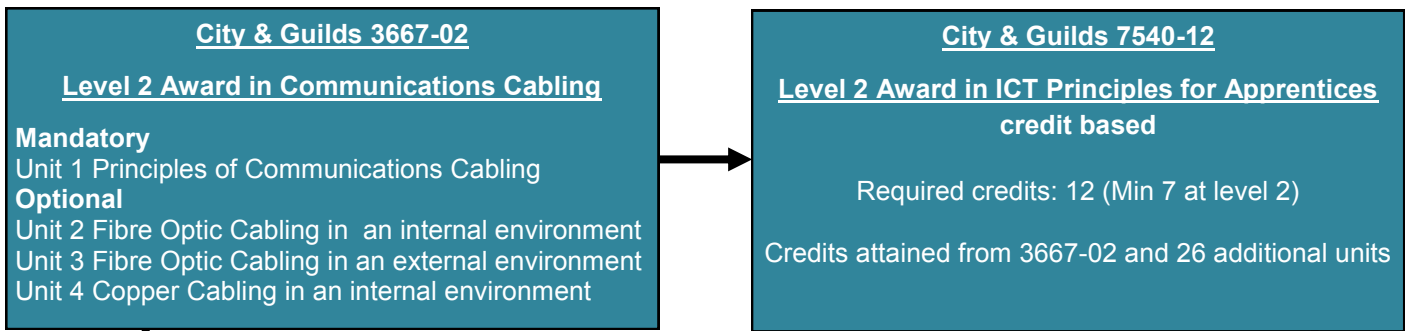


Award Organisation
Edexcel, City & Guilds



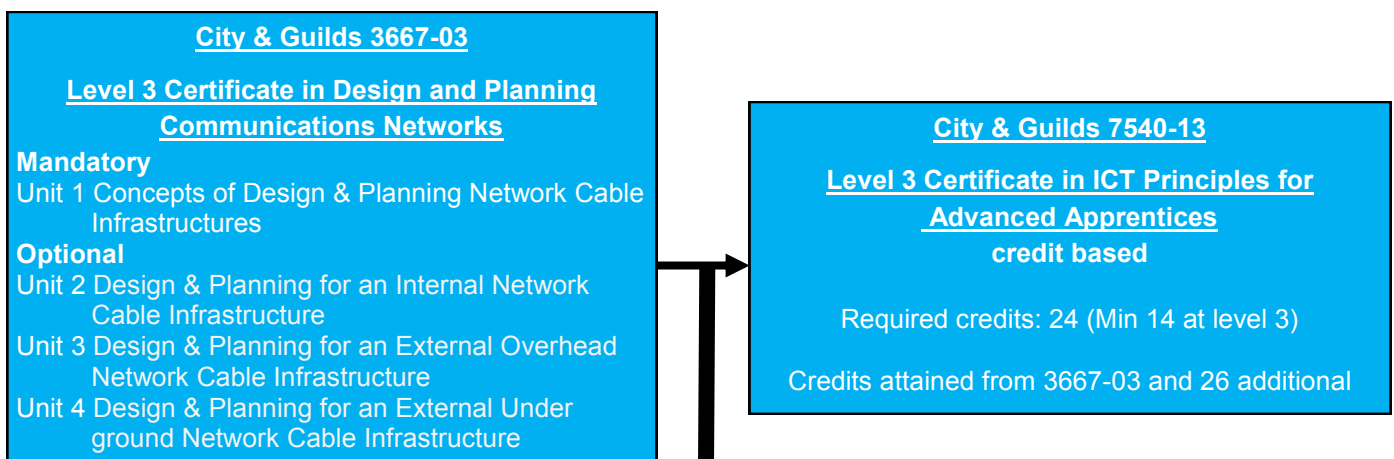
Credit transfer - Progression supported by credit being used across levels, sizes (Award, Certificate and Diploma) and sometimes sector areas. Reduces repetition of learning.

Level 2

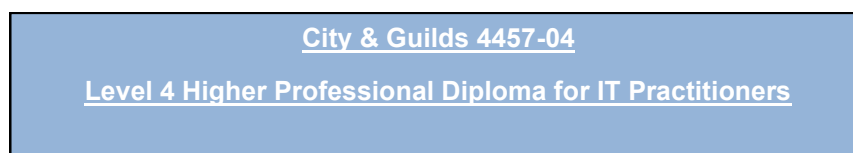


Credits earned from the completion of units from 3667-02 can contribute to the requirement of the level 2, 7540-12 award or be transferred and combined with the required level 3 credits to contribute towards the level 3, 7540-13 certificate.

Level 3



Level 4



All Prices Listed Below are Inclusive of VAT

Course Options

Here at Fibreplus Ltd we provide 4 course options, although other combinations of units are possible and can be accommodated by request.

Courses not provided within the options below can be added or changed, by request from you!!

Course Option 1: This course consists of,
7540-13 Unit 225 - Internal Fibre Optic Installation,
7540-13 Unit 357 - Design & Planning for an Internal Networks Cable Infrastructure
7540-13 Unit 358 - Design & Planning for an External Overhead Networks Cable Infrastructure

Cost for above £2,798.00

This is a 15 day (alternative learning period options see below) course and leads to a Level 3 City & Guilds Certificate.

Course Option 2: This course consists of,
7540-13 Unit 226 - External Fibre Cabling,
7540-13 Unit 357 - Design & Planning for an Internal Network Cable Infrastructure and
7540-13 Unit 358 - Design & Planning for an External Overhead Network Infrastructure.

Cost for above £2,798.00

This is a 15 day (alternative learning period options see below) course and leads to a Level 3 City & Guilds Certificate.

Course Option 3: This course consists of,
7540-13 Unit 226 - External Fibre Optic Installation, and
7540-13 Unit 358 - Design & Planning for an External Overhead Network Cable Infrastructure
7540-13 Unit 359 - Design & Planning for an External Underground Network Cable Infrastructure

Cost for above £2,798.00

This is a 15 day (alternative learning period options see below) course and leads to a Level 3 City & Guilds Certificate.

Course 4: This course consists of,
7540-13 Unit 225 - Internal Fibre Optic Installation and
7540-13 Unit 352 - Design & Planning for an Internal Network Cable Infrastructure.
7540-13 Unit 359 - Design & Planning for an External Underground Network Cable Infrastructure,

Cost for above £2,798.00

This is a 15 day (alternative learning period options see below) course and leads to a Level 3 City & Guilds Certificate.

Course 5: This course consists of,
3667-03 Unit 301 - Concepts of Design & Planning a Network Cable Infrastructure
3667-03 Unit 302 - Design & Planning for an Internal Network Cable Infrastructure.
3667-03 Unit 304 - Design & Planning for an External Underground Network Cable Infrastructure,

Cost for above £2,566.00

This is a 15 day (alternative learning period options see below) course and leads to a Level 3 City & Guilds Certificate.

Units 301, 302, 304 are all carried out over a 5 day period each.

Units 357, 358, 359, 302 & 304 can be completed in a variety of ways.

Study Option 1.

If you prefer, you can attend for each unit, which is delivered over a fixed 5 day period at our center at Westbury.

Study Option 2.

Attend a 1 day introduction for each unit, you will be set a series of tasks to be completed in your own time. These tasks will then be checked and evaluated by us after submittal via email. Once completed you will then need to attend for a final 2 days to carry out the exam project. These 2 days can be consecutive or separated, dependent on the your availability.

Venue: Main Fibreplus Ltd Training Centre: Westbury Wiltshire.
Centres: Westbury - Dunfermline - Peterborough - Lancaster - Surrey
Duration: Typically over a period of 15 days.
Dates: Available most weeks throughout the year, refer to calendar and call for booking availability.
Price: £2798—Exclusively at Fibreplus Ltd. Not to be beaten on a like for like basis.
FOR MORE DETAILED INFORMATION ON EACH UNIT PLEASE REFER TO THE RELEVANT SECTIONS IN THIS DOCUMENT

City & Guilds 7540

Internal Fibre Optic Installation (225)

Description: For installation Technicians, Supervisor, Managers, IT Specialists or those seeking a new career or apprenticeship. This unit covers Fibre Optic Installation and testing in an internal environment .

Introduction to Fibre Optics

Introduction
 Safety
 Optical Fibres

Installation

Fibre Types
 Cable Types
 Connectors
 Optical Splitters & Couplers
 Patch Panel & Distribution Boxes
 Installation & Planning Considerations
 Cable Installation and Preparation
 Jointing of Fibre Optics
 Splicing

Testing

Test Equipment and Correct Procedures

Exam and Assessment Method

City & Guilds Multiple Choice Assessment
 Practical Assessment

City & Guilds 7540 Design & Planning for an Internal Network Cable

Infrastructure (357)

Description: For those undergoing training or those employed as installation technicians of telecommunications and media networks. Also beneficial for the IT Managers & IT specialists or learners looking to progress within the industry and develop additional skills in design and planning of internal networks.

Design Concepts

Design Schematics
 Installation & Planning Considerations
 Network Infrastructure
 Fibre Types
 Cable Types
 Patch Panel & Distribution Boxes

Planning Concepts

Costing
 Plans and Records
 Detailed Plans
 Works Activities
 Legislation and Regulations
 Co-ordinate the Provision
 Provisioning Options

Exam and Assessment Method

Assessed Design Project

City & Guilds 7540 Design & Planning for an External Overhead Network

Infrastructure (358)

Description: For those undergoing training or those employed as installation technicians of telecommunications and media networks. Also beneficial for the IT Managers & IT specialists or learners looking to progress within the industry and develop additional skills in design and planning of internal networks.

Design Concepts

Design Schematics
 Installation & Planning Considerations
 Network Infrastructure
 Fibre Types
 Cable Types

Planning Concepts

Costing
 Plans and Records
 Detailed Plans
 Works Activities
 Legislation and Regulations
 Co-ordinate the Provision
 Provisioning Options
 Site Surveys

Exam and Assessment Method

Assessed Design Project

Main Training Centre

Fibreplus Ltd. Unit 1 - 4 Brook Lane,
 Westbury, Wiltshire. BA13 4ES
 Tel:- 01225 636041 email:-enq@fibreplus.co.uk

Venue: Main Fibreplus Ltd Training Centre: Westbury Wiltshire.
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City & Guilds 7540

External Fibre Optic Installation (226)

Description: For installation Technicians, Supervisor, Managers, IT Specialists or those seeking a new career or apprenticeship. This unit covers Fibre Optic Installation and testing in an external environment .

Introduction to Fibre Optics

Introduction
 Safety
 Optical Fibres

Installation

Fibre Types
 Cable Types
 Connectors
 Optical Splitters & Couplers
 Patch Panel & Distribution Boxes
 Installation & Planning Considerations
 Cable Installation and Preparation
 Jointing of Fibre Optics
 Splicing

Testing

Test Equipment and Correct Procedures

Exam and Assessment Method

City & Guilds Multiple Choice Assessment
 Practical Assessment

City & Guilds 7540 Design & Planning for an Internal Network Cable

Infrastructure (357)

Description: For those undergoing training or those employed as installation technicians of telecommunications and media networks. Also beneficial for the IT Managers & IT specialists or learners looking to progress within the industry and develop additional skills in design and planning of internal networks.

Design Concepts

Design Schematics
 Installation & Planning Considerations
 Network Infrastructure
 Fibre Types
 Cable Types
 Patch Panel & Distribution Boxes

Planning Concepts

Costing
 Plans and Records
 Detailed Plans
 Works Activities
 Legislation and Regulations
 Co-ordinate the Provision
 Provisioning Options

Exam and Assessment Method

Assessed Design Project

City & Guilds 7540 Design & Planning for an External Overhead Network

Infrastructure (358)

Description: For those undergoing training or those employed as installation technicians of telecommunications and media networks. Also beneficial for the IT Managers & IT specialists or learners looking to progress within the industry and develop additional skills in design and planning of external networks.

Design Concepts

Design Schematics
 Installation & Planning Considerations
 Network Infrastructure
 Fibre Types
 Cable Types

Planning Concepts

Costing
 Plans and Records
 Detailed Plans
 Works Activities
 Legislation and Regulations
 Co-ordinate the Provision
 Provisioning Options
 Site Surveys

Exam and Assessment Method

Assessed Design Project

Main Training Centre

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City & Guilds 7540

External Fibre Optic Installation (226)

Description: For installation Technicians, Supervisor, Managers, IT Specialists or those seeking a new career or apprenticeship. This unit covers Fibre Optic Installation and testing in an external environment .

Introduction to Fibre Optics

Introduction
Safety
Optical Fibres

Installation

Fibre Types
Cable Types
Connectors
Optical Splitters & Couplers
Patch Panel & Distribution Boxes
Installation & Planning Considerations
Cable Installation and Preparation
Joining of Fibre Optics
Splicing

Testing

Test Equipment and Correct Procedures

Exam and Assessment Method

City & Guilds Multiple Choice Assessment
Practical Assessment

City & Guilds 7540 Design & Planning for an External Under Ground

Network Cable Infrastructure (359)

Description: For those undergoing training or those employed as installation technicians of telecommunications and media networks. Also beneficial for the IT Managers & IT specialists or learners looking to progress within the industry and develop additional skills in design and planning of external networks.

Design Concepts

Design Schematics
Installation & Planning Considerations
Network Infrastructure
Fibre Types
Cable Types

Planning Concepts

Costing
Plans and Records
Detailed Plans
Works Activities
Legislation and Regulations
Co-ordinate the Provision
Provisioning Options
Site Surveys

Exam and Assessment Method

Assessed Design Project

City & Guilds 7540 Design & Planning for an External Overhead Network

Infrastructure (358)

Description: For those undergoing training or those employed as installation technicians of telecommunications and media networks. Also beneficial for the IT Managers & IT specialists or learners looking to progress within the industry and develop additional skills in design and planning of external networks.

Design Concepts

Design Schematics
Installation & Planning Considerations
Network Infrastructure
Fibre Types
Cable Types

Planning Concepts

Costing
Plans and Records
Detailed Plans
Works Activities
Legislation and Regulations
Co-ordinate the Provision
Provisioning Options
Site Surveys

Exam and Assessment Method

Assessed Design Project

Main Training Centre

Fibreplus Ltd. Unit 1 - 4 Brook Lane,
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City & Guilds 7540

Internal Fibre Optic Installation (225)

Description: For installation Technicians, Supervisor, Managers, IT Specialists or those seeking a new career or apprenticeship. This unit covers Fibre Optic Installation and testing in an internal environment .

Introduction to Fibre Optics

Introduction
 Safety
 Optical Fibres

Installation

Fibre Types
 Cable Types
 Connectors
 Optical Splitters & Couplers
 Patch Panel & Distribution Boxes
 Installation & Planning Considerations
 Cable Installation and Preparation
 Jointing of Fibre Optics
 Splicing

Testing

Test Equipment and Correct Procedures

Exam and Assessment Method

City & Guilds Multiple Choice Assessment
 Practical Assessment

City & Guilds 7540 Design & Planning for an External Under Ground

Network Cable Infrastructure (359)

Description: For those undergoing training or those employed as installation technicians of telecommunications and media networks. Also beneficial for the IT Managers & IT specialists or learners looking to progress within the industry and develop additional skills in design and planning of external networks.

Design Concepts

Design Schematics
 Installation & Planning Considerations
 Network Infrastructure
 Fibre Types
 Cable Types

Planning Concepts

Costing
 Plans and Records
 Detailed Plans
 Works Activities
 Legislation and Regulations
 Co-ordinate the Provision
 Provisioning Options
 Site Surveys

Exam and Assessment Method

Assessed Design Project

City & Guilds 7540 Design & Planning for an Internal Network

Infrastructure (357)

Description: For those undergoing training or those employed as installation technicians of telecommunications and media networks. Also beneficial for the IT Managers & IT specialists or learners looking to progress within the industry and develop additional skills in design and planning of internal networks.

Design Concepts

Design Schematics
 Installation & Planning Considerations
 Network Infrastructure
 Fibre Types
 Cable Types

Planning Concepts

Costing
 Plans and Records
 Detailed Plans
 Works Activities
 Legislation and Regulations
 Co-ordinate the Provision
 Provisioning Options
 Site Surveys

Exam and Assessment Method

Assessed Design Project

Main Training Centre

Fibreplus Ltd. Unit 1 - 4 Brook Lane,
 Westbury, Wiltshire. BA13 4ES
 Tel:- 01225 636041 email:-enq@fibreplus.co.uk

Description: Fibreplus Ltd. are registered to offer Enhanced Learning Credits to MOD personnel. The MOD's Enhanced Learning Credits Scheme (ELC) is an initiative to promote lifelong learning amongst members of the Armed Forces. The ELC scheme provides financial support in the form of a single up-front payment in each of a maximum of three separate financial years. You are reminded that ELC funding is only available for pursuit of higher level learning i.e. for courses that result in a nationally recognised qualification at Level three or above

Venue: Main Fibreplus Ltd Training Centre: Westbury Wiltshire.

Centres: Westbury - Dunfermline - Peterborough - Lancaster - Surrey

Duration: Variable

Dates: Available most weeks throughout the year, refer to Calendar and call for booking availability.

Price: Please refer to current price list. **FIBREPLUS PRICE GUARANTEE.** Not to be beaten on a like for like basis.

Course Options

City & Guilds 3667-03—Level 3 Certificate in Designing and Planning Communications Networks

- Unit 1 - Concepts of Designing & Planning a Communications Infrastructure
- Unit 2 - Design & Plan for an Internal Network Cabling Infrastructure
- Unit 3 - Design & Plan for an External Overhead Network Cabling Infrastructure
- Unit 4 - Design & Plan for an External Underground Network Cabling Infrastructure

City & Guilds 7540-13—Level 3 Certificate in ICT Systems and Principles for Advanced Apprentices

- Unit 225 - Fibre Optic Cabling in an Internal Environment
- Unit 226 - Fibre Optic Cabling in an External Environment
- Unit 227 - Copper Cabling in an Internal Environment
- Unit 357 - Design & Plan for an Internal Network Cabling Infrastructure
- Unit 358 - Design & Plan for an External Overhead Network Cabling Infrastructure
- Unit 359 - Design & Plan for an External Underground Network Cabling Infrastructure

City & Guilds 2377 - Level 3 Certificate for the Code of Practice for In-Service Inspection and Testing of Electrical Equipment

- Unit 100 - Management of Electrical Equipment Maintenance (2377-11)
- Unit 200 - Inspection and Testing of Electrical Equipment (2377-12)

BTEC Level 3 Advanced Award in Fibre Optic Test & Measurement

- Unit 1 - Concepts of Fibre Optic Testing
- Unit 2 - Fibre Optic Installation & Commissioning
- Unit 3 - Fibre Optic Fault Finding & Testing
- Unit 4 - Understanding Chromatic, Polarisation Mode Dispersion and FTTx Testing

Options are available to utilise either Enhanced Learning Credits or Resettlement Training Grants. In addition we can also offer the 2377 courses complete with a range of suitable equipment to get you up and running. Please contact us for current options and pricing.

SPECIAL OFFER: Spend more than £1550 per individual on any combination of training and receive the one day First Line Field Maintenance (FFME) course Free of charge (terms and conditions apply).

For further information on any of the above courses and available options or if you would like to discuss your specific training requirements please feel free to contact us.



Main Training Centre

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This award is aimed at new entrants, e.g. school leavers or for adults looking for a change in career, e.g. existing engineers. It may also serve as an introduction to the subjects for those in the industry including installation managers and network designers. The purpose of this qualification is to meet the wide ranging needs of the communications cabling industry which is part of the communications technologies sector. This level 2 award provides the specialist skills and knowledge required to carry out the installation of fibre optic and copper cabling.

Note

To receive the full 3667-02 award, the core unit 1 must be completed along with at least one of the optional units.

The units contained within this award are part of the QCF and can contribute credits to the following qualifications:

- City & Guilds 7540-12 Level 2 Award in ICT Systems and Principles for Apprentices.
- City & Guilds 7540-13 Level 3 Certificate in ICT Systems and Principles for Advanced Apprentices.

Unit 1: 3 credits

Unit 2: 6 credits

Unit 3: 6 credits

Unit 4: 6 credits

City & Guilds 3667-02 Unit 1 (Mandatory core unit)
Principles of Communications Cabling

This unit covers the principles of communications cabling.

Main topics covered:

- Safe working practices in communications systems.
- Basic principles of SI units symbols.
- Basic principles of communications systems
- Basic principles of data communication.

City & Guilds 3667-02 Unit 2 (Optional unit)
Fibre Optic Cabling in an Internal Environment

This unit covers Fibre Optic cabling in an internal environment.

Main topics covered:

- Safety regarding working with Fibre Optics in an internal environment.
- Recommended installation procedures and standards.
- Preparation of cable/fibres for connectorisation & splicing.
- Splicing of optical fibres.
- Connector termination.
- Testing of Fibre Optic links.

City & Guilds 3667-02 Unit 3 (Optional unit)
Fibre Optic Cabling in an External Environment

This unit covers Fibre Optic cabling in an external environment.

Main topics covered:

- Safety regarding working with Fibre Optics in an external environment.
- Recommended installation procedures and standards.
- Preparation of external cable/fibres for connectorisation & splicing.
- Jointing and splicing of Fibre Optic cables.
- Termination of Fibre Optics with pre-terminated pig-tails.
- Testing of Fibre Optic links.

City & Guilds 3667-02 Unit 4 (Optional unit)
Copper cabling in an Internal Environment

This unit covers Copper cabling in an internal environment.

Main topics covered:

- Safety regarding working with copper cabling in an external environment.
- Basic electrical theory and safety.
- Recommended installation procedures and standards.
- Termination of copper communication cabling.
- Testing copper communications cabling e.g. UTP/FTP etc.

- Description:** For installation Technicians, Supervisor, Managers, IT Specialists or a new career. Core unit 1, A requirement to achieve a complete 3667-02 full accreditation along with one of the following optional 3667-02 units 2, 3 or 4.
- Venue:** Main Fibreplus Ltd Training Centre: Westbury Wiltshire.
Centres: Westbury - Dunfermline - Peterborough - Lancaster - Surrey
- Duration:** Combined with either unit 2, 3 or 4, typically over a period of 5 or 10 days.
- Dates:** Available most weeks throughout the year, refer to Calendar and call for booking availability.
- Price:** Please refer to current price list. **FIBREPLUS PRICE GUARANTEE.** Not to be beaten on a like for like basis.

Health & Safety, Hazards & Regulations

Risk Assessment & Method Statement

- Assessment of risks
- Creating a method statement

Hazards

- Electricity
- Chemicals
- Light Sources
- Confined spaces
- Working at Height
- Asbestos
- Vermin

Regulations

- Health and Safety at Work
- PPE,
- PUWER
- Confined Space Regulation,
- Electrical at Work Regulation BS 7671
- Working at Height Regulation
- Control Of Substances Harmful To Health
- Laser Safety BS60825
- Asbestos Regulation

Understanding of Telecommunications Systems and Principles.

SI Units and symbols

- Electrical Symbols and Units
- Measurement
- Frequency

Understanding of basic electricity

- Ohms Law
- The Atom
- AC/DC
- EMI

Transmission Characteristics

- Principles of Voice, Video & Data systems
- Understanding of Bandwidth & Frequency
- Digital & Analogue
- RF transmission

Cable Type and Choices

- Category or Class
- Copper Components & Equipment
- Coaxial, 1308, UTP, FTP, STP & Multi-pair
- Fibre i.e. Multi /Single Mode
- OM1, OM2, OM3 or OS1

Fibre Optic Emitters & Detectors

- LED
- Laser
- VCSELs
- Photo Diode, PIN & APD

Theoretical Knowledge of cable installation

- Bandwidth Limitations
- Length, Distance Limitations
- Variants of Copper & Fibre Optics

Understanding of systems

- TDM
- DWDM
- WDM
- Multiplexing

Understanding of European & International Standards

- ITU
- Cenelec
- BS EN50173
- BS EN 50174 1-2
- ISO 11801
- ASSESSMENT

Cable Separation & Segregation

- IT Cabling Screened & Unscreened
- Power Screened & Unscreened
- Containment and Tray Population

Exam and Assessment Method

City & Guilds Multiple Choice Assessment

- Online 1 hour City and Guilds (Gola Exam) Multiple Choice 25 questions.



Main Training Centre

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Westbury, Wiltshire. BA13 4ES
Tel:- 01225 636041 email:-enq@fibreplus.co.uk

- Description:** For installation Technicians, Supervisor, Managers, IT Specialists or a new career. A requirement to achieve a complete 3667-02 full accreditation along with core unit 1. This unit covers Fibre Optic installation and testing in an internal environment .
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Centres: Westbury - Dunfermline - Peterborough - Lancaster - Surrey
- Duration:** Combined with either unit 1, 3 or 4, typically over a period of 5 or 10 days.
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Introduction to Fibre Optics

Introduction

- Telecommunications
- Pros and cons of fibre optics
- Measurement units
- Components
- Bandwidth, Frequency & Wavelength

Safety

- BS.7671 recommendations
- Safe working practices
- Laser radiation and safety

Optical Fibres

- How fibre works
- Multi mode and Single mode
- Parameters of operation
- Refractive Index
- Emitters & Detectors

Installation

Fibre Types

- Multi/Single mode for internal installations
- OM1, OM2, OM3 & OS1

Cable Types

- Cable types, use and construction
- Loose Tube, & Tight Buffered
- Distribution & Breakout

Connectors

- Connectors basics and types
- Polishes i.e. Super, Flat, Angled and Super Angled
- Use of microscope and identifying issues
- Practical Workshop

Optical Splitters & Couplers

- WDM, DWDM & CWDM

Patch Panel & Distribution Boxes

- Optical Distribution Frames
- Distribution Boxes
- Breakout ~Boxes

Installation & Planning Considerations

- Procedures to European & International Standards
- ISO 11801
- BS EN 50174
- BS EN 60825

Cable Installation and Preparation

- Cable handling issues
- Techniques and tools

Jointing of Fibre Optics

- Splice through and mid span
- Patch Panel components

Splicing

- Fusion splicing / Mechanical splicing
- Splicing - new developments
- Splicing pigtails v's direct connectorisation
- Cleaving
- Trouble shooting
- Splicing parameters

Testing

Test Equipment and Correct Procedures

- Using the VLS
- Setting up ILM Kit and referencing
- Light Source & Power Meter (ILM) Testing
- Workshop with Practical ILM Kit Use
- Understanding all Test equipment

- Understanding OTDR features and principles
- Event types i.e. Reflective and Non-Reflective
- Macro & Micro Bending explained
- Correct Fault Locating Principles

- Test Leads, Launch & Tail Leads
- OTDR Trace Analysis & Bi-Directional trace interpretation
- OTDR capability and limitation explained
- Workshop with Practical OTDR Use

Exam and Assessment Method

City & Guilds Multiple Choice Assessment

- Online 1 hour City and Guilds (Gola Exam) Multiple Choice 25 questions.
- Assessed practical exercises.

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Introduction to Fibre Optics

Introduction

- Telecommunications
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- Components
- Bandwidth, Frequency & Wavelength

Safety

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- Safe working practices
- Laser radiation and safety

Optical Fibres

- How fibre works
- Multi mode and Single mode
- Parameters of operation
- Refractive Index
- Emitters & Detectors

Installation

Fibre Types

- Multi/Single mode for external installations
- OM1, OM2, OM3 & OS1

Cable Types

- Cable types, use and construction
- Loose Tube, & Tight Buffered
- Distribution & Breakout

Connectors

- Connectors basics and types
- Polishes i.e. Super, Flat, Angled and Super Angled
- Use of microscope and identifying issues
- Practical Workshop

Optical Splitters & Couplers

- WDM, DWDM & CWDM

Patch Panel & Distribution Boxes

- Optical Distribution Frames
- Distribution Boxes
- Breakout ~Boxes

Installation & Planning Considerations

- Procedures to European & International Standards
- ISO 11801
- BS EN 50174
- BS EN 60825

Cable Installation and Preparation

- Cable handling issues
- Techniques and tools

Jointing of Fibre Optics

- Splice through and mid span
- Patch Panel components

Splicing

- Fusion splicing / Mechanical splicing
- Splicing - new developments
- Splicing pigtails v's direct connectorisation
- Cleaving
- Trouble shooting
- Splicing parameters
- Routine maintenance
- Arc Calibration

Testing

Test Equipment and Correct Procedures

- Using the VLS
- Setting up ILM Kit and referencing
- Light Source & Power Meter (ILM) Testing
- Workshop with Practical ILM Kit Use
- Understanding all Test equipment

- Understanding OTDR features and principles
- Event types i.e. Reflective and Non-Reflective
- Macro & Micro Bending explained
- Correct Fault Locating Principles

- Test Leads, Launch & Tail Leads
- OTDR Trace Analysis & Bi-Directional trace interpretation
- OTDR capability and limitation explained
- Workshop with Practical OTDR Use

Exam and Assessment Method

City & Guilds Multiple Choice Assessment

- Online 1 hour City and Guilds (Gola Exam) Multiple Choice 25 questions.
- Assessed practical exercises.

- Description:** For installation Technicians, Supervisor, Managers, IT Specialists or a new career. A requirement to achieve a complete 3667-02 full accreditation along with core unit 1. This unit covers Copper installation and testing in an internal environment .
- Venue:** Main Fibreplus Ltd Training Centre: Westbury Wiltshire.
Centres: Westbury - Dunfermline - Peterborough - Lancaster - Surrey
- Duration:** Combined with either unit 1, 2 or 3, typically over a period of 5 or 10 days.
- Dates:** Available most weeks throughout the year, refer to Calendar and call for booking availability.
- Price:** Please refer to current price list. **FIBREPLUS PRICE GUARANTEE.** Not to be beaten on a like for like basis.

Introduction to Copper Telecoms

Introduction

- Telecommunications
- Pros and cons of copper telecoms
- Components

Safety and Permission issues

- PPE
- Working & Height
- BS 7671
- Asbestos
- Building Grade and Permissions
- Fire Stopping

Installation

Design Criteria & Limitations

- Distance & Bandwidth
- Security & Cost

Cable Type and Choices

- Category 5e, 6 & 7 or Class D, E & F
- Copper Components & Active Equipment
- Coaxial, 1308, UTP, FTP, STP & Multi-pair

Installing Copper Structured Cabling

- Correct Termination Methods
- Digital & Analogue Telco Patch choices
- Correct cable laying procedures
- Cable support and Containment
- Segregation Limitations
- Earth bonding
- Labelling & Documentation

Termination of Copper Cabling

- 568a or 568B
- Shielding Issues
- IDC type i.e. Krone, 110 or Block66
- Correct use of tooling for connectors

Balans

- RGB
- Telephone
- Coaxial

Testing

European & International Standards

- ISO 11801
- EN 50173
- TIA/EIA 568-A

Understanding various types of testers

- Tone and Oscillators
- Wire-mapper
- Certification Testers i.e. Fluke & Omni-scanner etc.

Setting up copper test equipment

- Testing Standards
- NVP
- Shielded or UTP, Class or CAT, Channel or Fixed
- Copper Channel & Fixed / Permanent Link Tests

Testing Different Copper Cabling

- Acceptance Testing
- Schematics
- Copper Test Reports
- Copper Tests i.e. Next, Crosstalk & ACR etc.
- Earth Impedance Check and Report

Fault Finding

- Split Pairs
- Disconnections
- Reversals
- Crossed Pairs



Exam and Assessment Method

City & Guilds Multiple Choice Assessment

- Online 1 hour City and Guilds (Gola Exam) Multiple Choice 25 questions.
- Assessed practical exercises.

Main Training Centre

Fibreplus Ltd. Unit 1 - 4 Brook Lane,
Westbury, Wiltshire. BA13 4ES

Tel:- 01225 636041 email:-enq@fibreplus.co.uk

This certificate is aimed at new entrants, e.g. cable installers or for adults looking to enhance their promotion prospects e.g. network engineers. It is also suitable for learners who want career progression within the industry/related sector or to develop the skills learnt from other qualifications and need evidence towards their underpinning knowledge. The Level 3 Certificate in Designing & Planning Communications Networks combines the study of current telecommunications and computer networks, planning and management. The distinction between these career pathways has become blurred with issues such as bandwidth, security and quality of service becoming common with both.

This qualification also provides progression for learners who have completed the City & Guilds Level 2 Award in Communications Cabling and the Level 2 Diploma in ICT Systems & Principles.

Note

To receive the full 3667-03 certificate, the core unit 1 must be completed along with at least one of the optional units.

The units contained within this certificate are part of the QCF and can contribute credits to the following qualification:

- City & Guilds 7540-13 Level 3 Certificate in ICT systems and Principles for Advanced Apprentices.

Unit 1: 10 credits

Unit 2: 10 credits

Unit 3: 11 credits

Unit 4: 11 credits

City & Guilds 3667-03 Unit 1 (Mandatory core unit)
Concepts of Design & Planning a Network Cable Infrastructure

This unit covers the principles of designing and planning communications infrastructures in a range of environments.

Main topics covered:

- Terms & definitions used.
- Different types of communications infrastructures.
- Principles of planning and the importance of its drivers.
- Importance of UK 3rd party issues.
- Relevance of Operator License, other legislative requirements and Codes of Practice.
- Customer needs regarding engineering scope of works.
- Use of Project Management tools & techniques and other supporting documents.

City & Guilds 3667-03 Unit 2 (Optional unit)
Design & Planning for an Internal Network Cable Infrastructure

This unit covers the designing and planning of communications infrastructures in an internal environment.

Main topics covered:

- Site surveys for the provisions of an internal Networking Cabling Infrastructure (NCI).
- Options for the provisions of an internal NCI services.
- Selecting the optimum routes.
- Designing the provisions of an internal NCI.
- Designing & planning an internal NCI.
- Coordination of internal NCI provisions.

City & Guilds 3667-03 Unit 3 (Optional unit)
Design & Planning for an External Overhead Network Cable Infrastructure

This unit covers the designing and planning of communications infrastructures in an external overhead environment.

Main topics covered:

- Site surveys for the provisions of an external overhead cabling infrastructure.
- Selecting the optimum routes.
- Designing the provisions of an external overhead cabling
- Designing & planning for external overhead cabling infrastructures.
- Workflow activities for the provision of an external overhead cabling infrastructure.

City & Guilds 3667-03 Unit 4 (Optional unit)
Design & Planning for an External Underground Network Cable Infrastructure

This unit covers the designing and planning of communications infrastructures in an external underground environment.

Main topics covered:

- Site surveys for the provisions of an external underground cabling infrastructure.
- Selecting the optimum routes.
- Designing the provisions of an external underground cabling infrastructure.
- Designing & planning for external underground cabling infrastructures.
- Workflow activities for the provision of an external overhead cabling infrastructure.

Description: For those undergoing training or those employed as installation technicians in the telecommunications and media network. Also beneficial for the IT Managers & IT specialists or learners looking to progress within the industry and develop additional skills in design and planning. As the core unit it is a requirement to achieve a complete 3667-03 full accreditation along with one of the following optional 3667-03 units 2, 3 or 4.

Venue: Main Fibreplus Ltd Training Centre: Westbury Wiltshire.

Centres: Westbury - Dunfermline - Peterborough - Lancaster - Surrey

Duration: Combined with either unit 2, 3 or 4, typically over a period of 5 or 10 days.

Dates: Available most weeks throughout the year, refer to Calendar and call for booking availability.

Price: Please refer to current price list. **FIBREPLUS PRICE GUARANTEE.** Not to be beaten on a like for like basis.

Design Concepts

Types of Communications Infrastructures

- CCTV
- CATV
- Broadcast
- Access
- WAN
- LAN
- Mobile

Network Classes

- Underground
- Overhead
- Radio
- Satellite
- Free Space Optical
- Internal

Network Infrastructure

- Duct
- Chambers
- Trunking
- Earthing
- Cables
- Termination Equipment
- Poles
- Joints

Understanding of Standards

- BS EN50173
- BS EN 50174 1-2
- ISO 11801
- ASSESSMENT

Planning Concepts

Principles of Planning

- Define the role and reason for planning
- Drivers for planning
- Annual charges
- Inherent costs

Customer Needs and Engineering Scope of Works

- Translate customer needs to Scope of Works
- Interpret Drawings
- Growth Potential
- Strategic needs and phasing

Sources of Information

- Customer Order
- Building Drawings
- Specifications
- Local Authority

Preliminary Surveys

- Budget Estimates
- 3rd Party Issues
- Identify potential routes and issues

Detailed Survey

- Determine Optimum Route
- Engineering and 3rd Party Issues
- Accurate Time and Cost Estimate
- Assured Routes

UK 3rd Party Issues

- Way leave
- Impacts
- Method Statements
- NRSWA
- Critical Junctions

Operator License and Legislative Requirements

- Telecommunications Act
- Interconnection Regulation
- Highways Act
- New Roads and Street Works Act
- HASAW
- Environmental Health Act
- Traffic Management Act
- Town and Country Planning Act
- Code Powers
- Code of Practice

Project Management Tools and Techniques

- GANTT Charts
- Network Diagrams
- Critical Path
- Resource Allocation
- As-Built Records
- Geographical and Non-Geographical Records

Exam and Assessment Method

- City & Guilds 15 question Written Exam



Main Training Centre

Fibreplus Ltd. Unit 1 - 4 Brook Lane,
Westbury, Wiltshire. BA13 4ES

Tel:- 01225 636041 email:-enq@fibreplus.co.uk

- Description:** For those undergoing training or those employed as installation technicians of telecommunications and media networks. Also beneficial for the IT Managers & IT specialists or learners looking to progress within the industry and develop additional skills in design and planning of internal networks. Unit 2 is one of three options required to achieve a complete 3667-03 full accreditation along with the core unit 1.
- Venue:** **Main Fibreplus Ltd Training Centre: Westbury Wiltshire.**
Centres: Westbury - Dunfermline - Peterborough - Lancaster - Surrey
- Duration:** **Combined with either unit 1, 3 or 4, typically over a period of 5 or 10 days.**
- Dates:** Available most weeks throughout the year, refer to Calendar and call for booking availability.
- Price:** Please refer to current price list. **FIBREPLUS PRICE GUARANTEE.** Not to be beaten on a like for like basis.

Design Concepts

Design Schematics

- Valid Information
- Present and Future Requirements
- Identify Components and Quantities
- Optimisation
- Document Hazards
- Constraints and Limitations
- Design Tools

Fibre Types

- Multi/Single mode for internal installations
- OM1, OM2, OM3 & OS1

Installation & Planning Considerations

- Procedures to European & International Standards
- ISO 11801
- BS EN 50174
- BS EN 50173
- BS EN 60825

Cable Types

- Cable types, use and construction
- Loose Tube, & Tight Buffered
- Distribution & Breakout

Network Infrastructure

- Trunking
- Earthing
- Cables
- Termination Equipment

Patch Panel & Distribution Boxes

- Optical Distribution Frames
- Distribution Boxes
- Breakout Boxes

Planning Concepts

Costing

- Itemised
- Contingencies
- Confidentiality
- Records

Works Activities

- Comply with relevant legislation, regulations and safe working practices
- Optimise resources
- Maintain Existing Services
- Control Risks
- Procedures to be followed

Provisioning Options

- Risk/Cost Benefit
- Sensitivity Analysis
- Future Demands
- Forecasting
- Evaluate Different Options
- Long Term Requirements
- Authority to Proceed
- Documentation

Plans and Records

- Floor Plans
- Utilisation Records
- Duct Prints
- Rack Layouts
- Records

Legislation and Regulations

- Radio Frequency Allocation
- Planning Authority
- Highways Authority

Detailed Plans

- Identify Equipment Locations
- Risks and How to Control Them
- Work Flow
- Manpower
- Resource Management
- Timescales

Co-ordinate the Provision

- Works Program
- Timescales
- Resource Management
- Dependencies
- Critical Path Activities
- Specialist
- Reviews
- Safety and Quality Standards

Exam and Assessment Method

- **Assessed design project.**



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- Description:** For those undergoing training or those employed as installation technicians of telecommunications and media networks. Also beneficial for the IT Managers & IT specialists or learners looking to progress within the industry and develop additional skills in design and planning of external networks. Unit 3 is one of three options required to achieve a complete 3667-03 full accreditation along with the core unit 1.
- Venue:** **Main Fibreplus Ltd Training Centre: Westbury Wiltshire.**
Centres: Westbury - Dunfermline - Peterborough - Lancaster - Surrey
- Duration:** **Combined with either unit 1, 2 or 4, typically** over a period of 5 or 10 days.
- Dates:** Available most weeks throughout the year, refer to Calendar and call for booking availability.
- Price:** Please refer to current price list. **FIBREPLUS PRICE GUARANTEE.** Not to be beaten on a like for like basis.

Design Concepts

Design Schematics

- Valid Information
- Present and Future Requirements
- Identify Components and Quantities
- Optimisation
- Document Hazards
- Constraints and Limitations
- Design Tools

Fibre Types

- Multi/Single mode for external installations
- OM1, OM2, OM3 & OS1, OS2
- G652, G653, G654, G655, etc.

Installation & Planning Considerations

- Site Surveys
- Procedures to European & International Standards
- ISO 11801
- BS EN 50174
- BS EN50173
- BS EN 60825

Cable Types

- Cable types, use and construction
- Loose Tube, & Tight Buffered
- Distribution & Breakout

Network Infrastructure

- Duct
- Chambers
- Cables
- Termination Equipment
- Poles
- Joints

Planning Concepts

Legislation and Regulations

- Access Restrictions
- Overhead Power Lines
- Planning Authority
- Highways Authority

Detailed Plans

- Pole/duct Locations
- Identify Equipment Locations
- Risks and How to Control Them
- Work Flow
- Manpower
- Resource Management
- Timescales

Site Surveys

- Equipment Areas
- Available Space
- Existing and Planned Systems
- Cable Routes
- Survey Tools
- Hazards and Environmental Constraints
- Topographical Constraints
- Health and Safety Issues
- Power and Environmental Services
- Building Entry
- Variations

Costing

- Itemised
- Contingencies
- Confidentiality
- Records

Provisioning Options

- Risk/Cost Benefit
- Sensitivity Analysis
- Future Demands
- Forecasting
- Evaluate Different Options
- Long Term Requirements
- Authority to Proceed
- Documentation

Works Activities

- Comply with relevant legislation, regulations and safe working practices
- Optimise resources
- Accommodation and Support Services
- Specialist Equipment
- Maintain Existing Services
- Control Risks
- Procedures to be followed
- Acceptance Testing

Plans and Records

- OS Maps
- Utilisation Records
- Duct Prints
- Rack Layouts
- Records

Co-ordinate the Provision

- Works Program
- Timescales
- Resource Management
- Dependencies
- Critical Path Activities
- Specialist
- Reviews
- Safety and Quality Standards

Exam and Assessment Method

- **Assessed design project.**



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Fibreplus Ltd. Unit 1 - 4 Brook Lane,
Westbury, Wiltshire. BA13 4ES

Tel:- 01225 636041 email:-enq@fibreplus.co.uk

Description: For those undergoing training or those employed as installation technicians of telecommunications and media networks. Also beneficial for the IT Managers & IT specialists or learners looking to progress within the industry and develop additional skills in design and planning of external networks. Unit 4 is one of three options required to achieve a complete 3667-03 full accreditation along with the core unit 1.

Venue: Main Fibreplus Ltd Training Centre: Westbury Wiltshire.

Centres: Westbury - Dunfermline - Peterborough - Lancaster - Surrey

Duration: Combined with either unit 1, 2 or 3, typically over a period of 5 or 10 days.

Dates: Available most weeks throughout the year, refer to Calendar and call for booking availability.

Price: Please refer to current price list. **FIBREPLUS PRICE GUARANTEE.** Not to be beaten on a like for like basis.

Design Concepts

Design Schematics

- Valid Information
- Present and Future Requirements
- Identify Components and Quantities
- Optimisation
- Document Hazards
- Constraints and Limitations
- Design Tools

Fibre Types

- Multi/Single mode for external installations
- OM1, OM2, OM3 & OS1, OS2
- G652, G653, G654, G655, etc.

Installation & Planning Considerations

- Site Surveys
- Procedures to European & International Standards
- ISO 11801
- BS EN 50174
- BS EN50173
- BS EN 60825

Cable Types

- Cable types, use and construction
- Loose Tube, & Tight Buffered
- Distribution & Breakout

Network Infrastructure

- Duct
- Chambers
- Cables
- Termination Equipment
- Joints

Planning Concepts

Legislation and Regulations

- Access Restrictions
- Overhead Power Lines
- Planning Authority
- Highways Authority

Detailed Plans

- Duct and chamber Locations
- Identify Equipment Locations
- Risks and How to Control Them
- Work Flow
- Manpower
- Resource Management
- Timescales

Site Surveys

- Equipment Areas
- Available Space
- Existing and Planned Systems
- Cable Routes
- Survey Tools
- Hazards and Environmental Constraints
- Topographical Constraints
- Health and Safety Issues
- Power and Environmental Services
- Building Entry
- Variations

Costing

- Itemised
- Contingencies
- Confidentiality
- Records

Provisioning Options

- Risk/Cost Benefit
- Sensitivity Analysis
- Future Demands
- Forecasting
- Evaluate Different Options
- Long Term Requirements
- Authority to Proceed
- Documentation

Works Activities

- Comply with relevant legislation, regulations and safe working practices
- Optimise resources
- Accommodation and Support Services
- Specialist Equipment
- Maintain Existing Services
- Control Risks
- Procedures to be followed
- Acceptance Testing

Plans and Records

- OS Maps
- Utilisation Records
- Duct Prints
- Rack Layouts
- Records

Co-ordinate the Provision

- Works Program
- Timescales
- Resource Management
- Dependencies
- Critical Path Activities
- Specialist
- Reviews
- Safety and Quality Standards

Exam and Assessment Method

- Assessed design project.



Main Training Centre

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These qualifications are aimed at those with administrative responsibilities for the maintenance of electrical equipment and for those undertaking practical inspection and testing of electrical equipment. It also allows those with an administrative responsibility for the testing and inspection of electrical equipment to gain a qualification suitable to their job role.

The qualifications also form part of the Continuous Professional Development available to the electrical sector, allowing those working in the sector to develop their skills and keep up to date with requirements of working in the industry.

**City & Guilds 2377-11
Management of Electrical Equipment Maintenance**

Topics covered in this course:

- Law and scope of legislation relevant to the management of electrical equipment maintenance
- Types, use and testing of electrical equipment used for in-service inspection & testing
- Categories, frequency and practicalities of in-service inspection & testing
- Procedures, documentation and user responsibilities that are required for in-service inspection & testing
- Training that is required for in-service inspection and testing
- Appropriate test instruments and how they are used within in-service inspection & testing

**City & Guilds 2377-12
Inspection & Testing of Electrical Equipment**

Topics covered in this course:

- Equipment Construction
- Combined Inspection & Testing
- Equipment Considerations
- Inspection
- Use of instruments & recording of data

- Description:** The aim of this one day course is to enable candidates to manage the administrative responsibilities for the maintenance of electrical equipment.
- Venue:** **Main Fibreplus Ltd Training Centre: Westbury Wiltshire.**
Centres: Westbury - Dunfermline - Peterborough - Lancaster - Surrey
- Duration:** 1 Day.
- Dates:** Available most weeks throughout the year, refer to Calendar and call for booking availability.
- Price:** Please refer to current price list. **FIBREPLUS PRICE GUARANTEE.** Not to be beaten on a like for like basis.
- Prerequisite:** A copy of the *IEE Code of Practice for In-Service Inspection and Testing of Electrical Equipment 3rd edition* is required for this course.

Course Overview

Law and scope of legislation relevant to the management of electrical equipment maintenance:

- Health & Safety requirements including:
 - i. Responsibilities
 - ii. Risk assessments
 - iii. PPE
 - iv. BS 7671
- Legislation regarding system voltage.
- Acts & regulations regarding properties and premises
- Health & Safety regarding:
 - i. Electrical equipment.
 - ii. Procedures for isolating supplies
- Legal requirements regarding maintenance electrical equipment.
- Importance of inspecting & testing electrical equipment and systems

Types, use and testing of electrical equipment used for in-service inspection & testing:

- Classification of types and construction of electrical equipment
- Electrical equipment construction regarding protection against shocks.
- Requirements for inspection and testing of extension leads
- Different types of tests
- Test requirements following repairs to electrical equipment

Categories, frequency and practicalities of in-service inspection & testing:

- Categories of inspection & testing.
- Factors governing the frequency of in-service inspection & testing.
- Purpose of *TABLE 7.1 Initial frequency of inspection & testing equipment.
- Requirements for visual inspection/examination and the contents of *Appendix VIII.
- Tests required for in-service inspection & testing of equipment.

Procedures, documentation and user responsibilities that are required for in-service inspection & testing:

- Modal forms in the *Code Of Practice* regarding results of electrical inspection & testing.
- Reasons for equipment identification, numbering and labelling.
- Testing requirements & recording results/information.
- Interpretation of test results.
- Identification of instrument requirements
- Procedures for dealing with faulty equipment.

Training that is required for in-service inspection and testing:

- "Electricity at Work Regulations" requirements for maintaining electrical equipment.
- Training requirements for users regarding:
 - i. Safe use of equipment
 - ii. Identification of faulty/damaged equipment
- Training requirements for managers regarding:
 - i. Risk assessment of the work place
 - ii. Maintaining records of electrical maintenance.
 - iii. Interpretation of test results.
- Training requirements for inspectors.

Appropriate test instruments and how they are used within in-service inspection & testing:

- Instruments suitable for testing electrical equipment.
- Types of continuity testers & their short circuit test current(s).
- Determining equipment's:
 - i. Insulation resistance
 - ii. Earth leakage/touch current measurements
- Correct indication of instrument voltage and current.
- Procedures for conducting electrical tests.

Exam and Assessment Method

City & Guilds Multiple Choice Assessment

- 1 hour online City and Guilds (Gola Exam) Multiple Choice 30 questions.
- Assessed practical exercises.

Items marked with * related to the *IEE Code of Practice for In-Service Inspection and Testing of Electrical Equipment 3rd edition*

- Description:** This one day Portable Appliance Testing course provides an explanation of the practical aspects of complying with legislation for the safe operation of electrical appliances. During the course the candidate's ability to perform the tests, record the results and interpret the data will be assessed.
- Venue:** Main Fibreplus Ltd Training Centre: Westbury Wiltshire.
Centres: Westbury - Dunfermline - Peterborough - Lancaster - Surrey
- Duration:** 1 Day.
- Dates:** Available most weeks throughout the year, refer to Calendar and call for booking availability.
- Price:** Please refer to current price list. **FIBREPLUS PRICE GUARANTEE.** Not to be beaten on a like for like basis.

Course Overview

Equipment Construction:

- Different types of equipment, forms of construction and classification marks.
- Risks of electric shock due to poor protection
- Equipment construction regards shock protection
- Effects of leads and cord sets regarding disconnection times.
- RCD protection

Inspection:

- User checks
- Formal visual inspection/examination
- Combined inspection/examination & testing
- Visual inspection considerations.

Combined inspection & testing:

- Factors of Visual inspection/examination
- Purpose of tests, including:
 - i. Earth continuity
 - ii. Insulation resistance
 - iii. Earth leakage/touch current
 - iv. Operation/load checking
 - v. Extension leads/cords.
- Correct & incorrect tests.
- Varieties of test equipment

Use of instruments & recording of data:

- Min & max acceptable conductor and insulation resistances.
- Leakage & Touch currents
- Identification Labels
- Interpretation of results

Equipment consideration:

- Procedures for faulty & damaged equipment.
- Considerations for appliance couplers & cord sets.
- Testing procedures for microwave ovens.
- Considerations for IT equipment.
- Requirements for appliance cables, cords & fuse sizes.
- Required tests following equipment repair.

Exam and Assessment Method

City & Guilds Multiple Choice Assessment

- 1 hour online City and Guilds (Gola Exam) Multiple Choice 30 questions.



Main Training Centre

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Tel:- 01225 636041 email:-enq@fibreplus.co.uk

These qualifications are aimed at new entrants, e.g. school leavers or for adults looking for a change in career, e.g. existing engineers. The purpose of this qualification is to meet the wide ranging needs of the communications industry which is part of the communications technologies sector. They aim to:

- Meet the needs of candidates who work or want to work in a number of differing job roles within the telecommunication/ICT sector.
- Allow candidates to learn, develop and practice the skills required for employment and/or career progression in the telecommunications/ICT sector
- Serve as the Systems and Principles part of the Apprenticeship framework
- Provide valuable accreditation of skills and knowledge for candidates.

The units contained within these awards are part of the QCF and can contribute credits towards the following qualifications:

- City & Guilds 3667-02 Level 2 Award in Communications Cabling.
- City & Guilds 3667-03 Level 3 Certificate in Designing and Planning Communications Networks .

City & Guilds 7540-12 Level 2 Award in ICT Systems and Principles for Apprentices

This award requires the combination of QCF units listed below to be achieved. **Requires 10 days**

- **Unit 225** - Fibre Optic Cabling in an Internal Environment
- **Unit 226** - Fibre Optic Cabling in an External Environment
- **Unit 227** - Copper Cabling in an Internal Environment

City & Guilds 7540-13 : Fibre Option Level 3 Certificate in ICT Systems and Principles for Advanced Apprentices

This award requires the combination of QCF units listed below to be achieved. **Requires 15 days**

- **Unit 225** - Fibre Optic Cabling in an Internal Environment
 - **Unit 226** - Fibre Optic Cabling in an External Environment
- Plus** choose 2 additional options from the 3 units below.
- **Unit 357** - Design and Plan for an Internal Network Cabling Infrastructure
 - **Unit 358** - Design and Plan for an External Overhead Network Cabling Infrastructure
 - **Unit 359** - Design and Plan for an External Underground Network Cabling Infrastructure.

City & Guilds 7540-13 : Internal Fibre & Copper Option Level 3 Certificate in ICT Systems and Principles for Advanced Apprentices

This award requires the combination of QCF units listed below to be achieved. **Requires 20 days**

- **Unit 227** - Copper Cabling in an Internal Environment
 - **Unit 225** - Fibre Optic Cabling in an Internal Environment
 - **Unit 357** - Design and Plan for an Internal Network Cabling Infrastructure
- Plus** choose 1 additional option from the 2 units below.
- **Unit 358** - Design and Plan for an External Overhead Network Cabling Infrastructure
 - **Unit 359** - Design and Plan for an External Underground Network Cabling Infrastructure.

- Description:** For installation Technicians, Supervisor, Managers, IT Specialists or a new career or apprenticeship. This unit covers Fibre Optic installation and testing in an internal environment .
- Venue:** Main Fibreplus Ltd Training Centre: Westbury Wiltshire.
Centres: Westbury - Dunfermline - Peterborough - Lancaster - Surrey
- Duration:** typically over a period of 5 or 10 days in conjunction with other options.
- Dates:** Available most weeks throughout the year, refer to Calendar and call for booking availability.
- Price:** Please refer to current price list. **FIBREPLUS PRICE GUARANTEE.** Not to be beaten on a like for like basis.

Introduction to Fibre Optics

Introduction

- Telecommunications
- Pros and cons of fibre optics
- Measurement units
- Components
- Bandwidth, Frequency & Wavelength

Safety

- BS.7671 recommendations
- Safe working practices
- Laser radiation and safety

Optical Fibres

- How fibre works
- Multi mode and Single mode
- Parameters of operation
- Refractive Index
- Emitters & Detectors

Installation

Fibre Types

- Multi/Single mode for internal installations
- OM1, OM2, OM3 & OS1

Cable Types

- Cable types, use and construction
- Loose Tube, & Tight Buffered
- Distribution & Breakout

Connectors

- Connectors basics and types
- Polishes i.e. Super, Flat, Angled and Super Angled
- Use of microscope and identifying issues
- Practical Workshop

Optical Splitters & Couplers

- WDM, DWDM & CWDM

Patch Panel & Distribution Boxes

- Optical Distribution Frames
- Distribution Boxes
- Breakout ~Boxes

Installation & Planning Considerations

- Procedures to European & International Standards
- ISO 11801
- BS EN 50174
- BS EN 60825

Cable Installation and Preparation

- Cable handling issues
- Techniques and tools

Joining of Fibre Optics

- Splice through and mid span
- Patch Panel components

Splicing

- Fusion splicing / Mechanical splicing
- Splicing - new developments
- Splicing pigtails v's direct connectorisation
- Cleaving
- Trouble shooting
- Splicing parameters
- Routine maintenance
- Arc Calibration

Testing

Test Equipment and Correct Procedures

- Using the VLS
- Setting up ILM Kit and referencing
- Light Source & Power Meter (ILM) Testing
- Workshop with Practical ILM Kit Use
- Understanding all Test equipment

- Understanding OTDR features and principles
- Event types i.e. Reflective and Non-Reflective
- Macro & Micro Bending explained
- Correct Fault Locating Principles

- Test Leads, Launch & Tail Leads
- OTDR Trace Analysis & Bi-Directional trace interpretation
- OTDR capability and limitation explained
- Workshop with Practical OTDR Use

Exam and Assessment Method

City & Guilds Multiple Choice Assessment

- Online 1 hour City and Guilds (Gola Exam) Multiple Choice 25 questions.
- Assessed practical exercises.

- Description:** For installation Technicians, Supervisor, Managers, IT Specialists or a new career or apprenticeship. This unit covers Fibre Optic installation and testing in an external environment .
- Venue:** **Main Fibreplus Ltd Training Centre: Westbury Wiltshire.**
Centres: Westbury - Dunfermline - Peterborough - Lancaster - Surrey
- Duration:** typically over a period of 5 or 10 days in conjunction with other options
- Dates:** Available most weeks throughout the year, refer to Calendar and call for booking availability.
- Price:** Please refer to current price list. **FIBREPLUS PRICE GUARANTEE.** Not to be beaten on a like for like basis.

Introduction to Fibre Optics

Introduction

- Telecommunications
- Pros and cons of fibre optics
- Measurement units
- Components
- Bandwidth, Frequency & Wavelength

Safety

- BS.7671 recommendations
- Safe working practices
- Laser radiation and safety

Optical Fibres

- How fibre works
- Multi mode and Single mode
- Parameters of operation
- Refractive Index
- Emitters & Detectors

Installation

Fibre Types

- Multi/Single mode for external installations
- OM1, OM2, OM3 & OS1

Cable Types

- Cable types, use and construction
- Loose Tube, & Tight Buffered
- Distribution & Breakout

Connectors

- Connectors basics and types
- Polishes i.e. Super, Flat, Angled and Super Angled
- Use of microscope and identifying issues
- Practical Workshop

Optical Splitters & Couplers

- WDM, DWDM & CWDM

Patch Panel & Distribution Boxes

- Optical Distribution Frames
- Distribution Boxes
- Breakout ~Boxes

Installation & Planning Considerations

- Procedures to European & International Standards
- ISO 11801
- BS EN 50174
- BS EN 60825

Cable Installation and Preparation

- Cable handling issues
- Techniques and tools

Jointing of Fibre Optics

- Splice through and mid span
- Patch Panel components

Splicing

- Fusion splicing / Mechanical splicing
- Splicing - new developments
- Splicing pigtails v's direct connectorisation
- Cleaving
- Trouble shooting
- Splicing parameters
- Routine maintenance
- Arc Calibration

Testing

Test Equipment and Correct Procedures

- Using the VLS
- Setting up ILM Kit and referencing
- Light Source & Power Meter (ILM) Testing
- Workshop with Practical ILM Kit Use
- Understanding all Test equipment

- Understanding OTDR features and principles
- Event types i.e. Reflective and Non-Reflective
- Macro & Micro Bending explained
- Correct Fault Locating Principles

- Test Leads, Launch & Tail Leads
- OTDR Trace Analysis & Bi-Directional trace interpretation
- OTDR capability and limitation explained
- Workshop with Practical OTDR Use

Exam and Assessment Method

City & Guilds Multiple Choice Assessment

- Online 1 hour City and Guilds (Gola Exam) Multiple Choice 25 questions.
- Assessed practical exercises.

- Description:** For installation Technicians, Supervisor, Managers, IT Specialists or a new career or apprenticeship. This unit covers Copper installation and testing in an internal environment .
- Venue:** Main Fibreplus Ltd Training Centre: Westbury Wiltshire.
Centres: Westbury - Dunfermline - Peterborough - Lancaster - Surrey
- Duration:** typically over a period of 5 or 10 days in conjunction with other options.
- Dates:** Available most weeks throughout the year, refer to Calendar and call for booking availability.
- Price:** Please refer to current price list. **FIBREPLUS PRICE GUARANTEE.** Not to be beaten on a like for like basis.

Introduction to Copper Telecoms

Introduction

- Telecommunications
- Pros and cons of copper telecoms
- Components

Safety and Permission issues

- PPE
- Working & Height
- BS 7671
- Asbestos
- Building Grade and Permissions
- Fire Stopping

Installation

Design Criteria & Limitations

- Distance & Bandwidth
- Security & Cost

Cable Type and Choices

- Category 5e, 6 & 7 or Class D, E & F
- Copper Components & Active Equipment
- Coaxial, 1308, UTP, FTP, STP & Multi-pair

Installing Copper Structured Cabling

- Correct Termination Methods
- Digital & Analogue Telco Patch choices
- Correct cable laying procedures
- Cable support and Containment
- Segregation Limitations
- Earth bonding
- Labelling & Documentation

Termination of Copper Cabling

- 568a or 568B
- Shielding Issues
- IDC type i.e. Krone, 110 or Block66
- Correct use of tooling for connectors

Balans

- RGB
- Telephone
- Coaxial

Testing

European & International Standards

- ISO 11801
- EN 50173
- TIA/EIA 568-A

Understanding various types of testers

- Tone and Oscillators
- Wire-mapper
- Certification Testers i.e. Fluke & Omni-scanner etc.

Setting up copper test equipment

- Testing Standards
- NVP
- Shielded or UTP, Class or CAT, Channel or Fixed
- Copper Channel & Fixed / Permanent Link Tests

Testing Different Copper Cabling

- Acceptance Testing
- Schematics
- Copper Test Reports
- Copper Tests i.e. Next, Crosstalk & ACR etc.
- Earth Impedance Check and Report

Fault Finding

- Split Pairs
- Disconnections
- Reversals
- Crossed Pairs



Exam and Assessment Method

City & Guilds Multiple Choice Assessment

- Online 1 hour City and Guilds (Gola Exam) Multiple Choice 25 questions.
- Assessed practical exercises.

Main Training Centre

Fibreplus Ltd. Unit 1 - 4 Brook Lane,
Westbury, Wiltshire. BA13 4ES

Tel:- 01225 636041 email:-enq@fibreplus.co.uk

- Description:** For those undergoing training or those employed as installation technicians of telecommunications and media networks. Also beneficial for the IT Managers & IT specialists or learners looking to progress within the industry and develop additional skills in design and planning of internal networks. Unit 2 is one of three options required to achieve a complete 3667-03 full accreditation along with the core unit 1.
- Venue:** Main Fibreplus Ltd Training Centre: Westbury Wiltshire.
Centres: Westbury - Dunfermline - Peterborough - Lancaster - Surrey
- Duration:** Combined with either unit 1, 3 or 4, typically over a period of 5 or 10 days.
- Dates:** Available most weeks throughout the year, refer to Calendar and call for booking availability.
- Price:** Please refer to current price list. **FIBREPLUS PRICE GUARANTEE.** Not to be beaten on a like for like basis.

Design Concepts

Design Schematics

- Valid Information
- Present and Future Requirements
- Identify Components and Quantities
- Optimisation
- Document Hazards
- Constraints and Limitations
- Design Tools

Fibre Types

- Multi/Single mode for internal installations
- OM1, OM2, OM3 & OS1

Installation & Planning Considerations

- Procedures to European & International Standards
- ISO 11801
- BS EN 50174
- BS EN 50173
- BS EN 60825

Cable Types

- Cable types, use and construction
- Loose Tube, & Tight Buffered
- Distribution & Breakout

Network Infrastructure

- Trunking
- Earthing
- Cables
- Termination Equipment

Patch Panel & Distribution Boxes

- Optical Distribution Frames
- Distribution Boxes
- Breakout Boxes

Planning Concepts

Costing

- Itemised
- Contingencies
- Confidentiality
- Records

Works Activities

- Comply with relevant legislation, regulations and safe working practices
- Optimise resources
- Maintain Existing Services
- Control Risks
- Procedures to be followed

Provisioning Options

- Risk/Cost Benefit
- Sensitivity Analysis
- Future Demands
- Forecasting
- Evaluate Different Options
- Long Term Requirements
- Authority to Proceed
- Documentation

Plans and Records

- Floor Plans
- Utilisation Records
- Duct Prints
- Rack Layouts
- Records

Legislation and Regulations

- Radio Frequency Allocation
- Planning Authority
- Highways Authority

Detailed Plans

- Identify Equipment Locations
- Risks and How to Control Them
- Work Flow
- Manpower
- Resource Management
- Timescales

Co-ordinate the Provision

- Works Program
- Timescales
- Resource Management
- Dependencies
- Critical Path Activities
- Specialist
- Reviews
- Safety and Quality Standards

Exam and Assessment Method

- Assessed design project.

- Description:** For those undergoing training or those employed as installation technicians of telecommunications and media networks. Also beneficial for the IT Managers & IT specialists or learners looking to progress within the industry and develop additional skills in design and planning of external networks. Unit 3 is one of three options required to achieve a complete 3667-03 full accreditation along with the core unit 1.
- Venue:** Main Fibreplus Ltd Training Centre: Westbury Wiltshire.
Centres: **Westbury - Dunfermline - Peterborough - Lancaster - Surrey**
- Duration:** **Combined with either unit 1, 2 or 4, typically** over a period of 5 or 10 days.
- Dates:** Available most weeks throughout the year, refer to Calendar and call for booking availability.
- Price:** Please refer to current price list. **FIBREPLUS PRICE GUARANTEE.** Not to be beaten on a like for like basis.

Design Concepts

Design Schematics

- Valid Information
- Present and Future Requirements
- Identify Components and Quantities
- Optimisation
- Document Hazards
- Constraints and Limitations
- Design Tools

Fibre Types

- Multi/Single mode for external installations
- OM1, OM2, OM3 & OS1, OS2
- G652, G653, G654, G655, etc.

Installation & Planning Considerations

- Site Surveys
- Procedures to European & International Standards
- ISO 11801
- BS EN 50174
- BS EN50173
- BS EN 60825

Cable Types

- Cable types, use and construction
- Loose Tube, & Tight Buffered
- Distribution & Breakout

Network Infrastructure

- Duct
- Chambers
- Cables
- Termination Equipment
- Poles
- Joints

Planning Concepts

Legislation and Regulations

- Access Restrictions
- Overhead Power Lines
- Planning Authority
- Highways Authority

Detailed Plans

- Pole/duct Locations
- Identify Equipment Locations
- Risks and How to Control Them
- Work Flow
- Manpower
- Resource Management
- Timescales

Site Surveys

- Equipment Areas
- Available Space
- Existing and Planned Systems
- Cable Routes
- Survey Tools
- Hazards and Environmental Constraints
- Topographical Constraints
- Health and Safety Issues
- Power and Environmental Services
- Building Entry
- Variations

Costing

- Itemised
- Contingencies
- Confidentiality
- Records

Provisioning Options

- Risk/Cost Benefit
- Sensitivity Analysis
- Future Demands
- Forecasting
- Evaluate Different Options
- Long Term Requirements
- Authority to Proceed
- Documentation

Works Activities

- Comply with relevant legislation, regulations and safe working practices
- Optimise resources
- Accommodation and Support Services
- Specialist Equipment
- Maintain Existing Services
- Control Risks
- Procedures to be followed
- Acceptance Testing

Plans and Records

- OS Maps
- Utilisation Records
- Duct Prints
- Rack Layouts
- Records

Co-ordinate the Provision

- Works Program
- Timescales
- Resource Management
- Dependencies
- Critical Path Activities
- Specialist
- Reviews
- Safety and Quality Standards

Exam and Assessment Method

- **Assessed design project.**



Main Training Centre

Fibreplus Ltd. Unit 1 - 4 Brook Lane,
Westbury, Wiltshire. BA13 4ES

Tel:- 01225 636041 email:-enq@fibreplus.co.uk

- Description:** For those undergoing training or those employed as installation technicians of telecommunications and media networks. Also beneficial for the IT Managers & IT specialists or learners looking to progress within the industry and develop additional skills in design and planning of external networks. Unit 4 is one of three options required to achieve a complete 3667-03 full accreditation along with the core unit 1.
- Venue:** Main Fibreplus Ltd Training Centre: Westbury Wiltshire.
Centres: Westbury - Dunfermline - Peterborough - Lancaster - Surrey
- Duration:** Combined with either unit 1, 2 or 3, typically over a period of 5 or 10 days.
- Dates:** Available most weeks throughout the year, refer to Calendar and call for booking availability.
- Price:** Please refer to current price list. **FIBREPLUS PRICE GUARANTEE.** Not to be beaten on a like for like basis.

Design Concepts

Design Schematics

- Valid Information
- Present and Future Requirements
- Identify Components and Quantities
- Optimisation
- Document Hazards
- Constraints and Limitations
- Design Tools

Fibre Types

- Multi/Single mode for external installations
- OM1, OM2, OM3 & OS1, OS2
- G652, G653, G654, G655, etc.

Installation & Planning Considerations

- Site Surveys
- Procedures to European & International Standards
- ISO 11801
- BS EN 50174
- BS EN50173
- BS EN 60825

Cable Types

- Cable types, use and construction
- Loose Tube, & Tight Buffered
- Distribution & Breakout

Network Infrastructure

- Duct
- Chambers
- Cables
- Termination Equipment
- Joints

Planning Concepts

Legislation and Regulations

- Access Restrictions
- Overhead Power Lines
- Planning Authority
- Highways Authority

Detailed Plans

- Duct and chamber Locations
- Identify Equipment Locations
- Risks and How to Control Them
- Work Flow
- Manpower
- Resource Management
- Timescales

Site Surveys

- Equipment Areas
- Available Space
- Existing and Planned Systems
- Cable Routes
- Survey Tools
- Hazards and Environmental Constraints
- Topographical Constraints
- Health and Safety Issues
- Power and Environmental Services
- Building Entry
- Variations

Costing

- Itemised
- Contingencies
- Confidentiality
- Records

Provisioning Options

- Risk/Cost Benefit
- Sensitivity Analysis
- Future Demands
- Forecasting
- Evaluate Different Options
- Long Term Requirements
- Authority to Proceed
- Documentation

Works Activities

- Comply with relevant legislation, regulations and safe working practices
- Optimise resources
- Accommodation and Support Services
- Specialist Equipment
- Maintain Existing Services
- Control Risks
- Procedures to be followed
- Acceptance Testing

Plans and Records

- OS Maps
- Utilisation Records
- Duct Prints
- Rack Layouts
- Records

Co-ordinate the Provision

- Works Program
- Timescales
- Resource Management
- Dependencies
- Critical Path Activities
- Specialist
- Reviews
- Safety and Quality Standards



Exam and Assessment Method

- Assessed design project.

Main Training Centre

Fibreplus Ltd. Unit 1 - 4 Brook Lane,
Westbury, Wiltshire. BA13 4ES

Tel:- 01225 636041 email:-enq@fibreplus.co.uk

The BTEC accredited test & measurement course provides additional training for those who wish to increase their understanding or specialise in the field of Fibre Optic testing. This course covers testing techniques and the use of standard Fibre Optic test equipment (VLS/VFL, Light Source & Power Meter, and OTDR). In addition to time spent on chromatic and polarisation mode dispersion and FTTX testing.

This course leads to a nationally recognised BTEC accredited Level 3 advanced award and is covered in 4 units.

Fibre Optic Test & Measurement

This course covers these follow topics:

Unit 1: Concepts of Fibre Optic Testing

- Introduction to fibre optic testing
- Common terms used.
- Power & Loss budgets.
- Fibre Types
- Recognising Fibre Issues
- Fibre Equipment types

Unit 2: Fibre Optic Installation & Commissioning

- Stage 1 a,1b and 2 testing
- Optical Loss Budgets
- Fusion splicing, Mechanical splicing and BFA's
- Test leads—Launch and Reference
- Standards
- Testing procedures:
 - i. Acceptance
 - ii. Installed cable
 - iii. Complete system certification
- Documentation

Unit 3: Fibre Optic Fault Finding & Testing

- Introduction to advanced testing & common terms used.
- Power & Loss budgets.
- Connectors
- Testing Equipment & Techniques:
 - i. VLS/VFL testing.
 - ii. Fibre identifier
 - iii. Microscopes
 - iv. ILM (Light source & Power Meter)
 - v. OTDR Testing
- Documentation

Unit 4: Understanding Chromatic, Polarisation Mode Dispersion and FTTx Testing

- Effects of PMD and CD
- Limitations
- How to minimise PMD and CD
- How to test PMD and CD
- Additional considerations when testing FTTx
 - I. Optimised test equipment
 - II. Certification tools

Please see additional pages for in-depth course content.

- Description:** This course covers all areas to include fault finding and commission fibre optic systems. This course is aimed at those who have a good understanding of fibre optics and wish to expand their knowledge and experience as well as achieve an accredited qualification in this area.
- Venue:** Main Fibreplus Ltd Training Centre: Westbury Wiltshire.
Centres: Westbury - Dunfermline - Peterborough - Lancaster - Surrey
- Prerequisite:** This course requires a good knowledge of fibre optic, please refer to our City & Guilds 3667-02 Qualification or Fibreplus Ltd accredited 5 day course to achieve the knowledge required to get the most from this course.
- Duration:** 5 days.
- Dates:** Available most weeks throughout the year, refer to Calendar and call for booking availability.
- Price:** Please refer to current price list. **FIBREPLUS PRICE GUARANTEE.** Not to be beaten on a like for like basis.

Introduction to Fibre Optic Testing

Common Terms

- Wavelength, Frequency, dB Loss, dBm Power
- Fibres i.e. OM1, OM2 OM3 & OS1 G652 to G657
- Absorption and scattering, Electromagnetic Spectrum
- Optical Bands O, E, S, C, L & U
- BS Symbols for system diagrams

Health & Safety Considerations

- HASAW
- PPE
- Electricity at Work Regulations
- COSHH
- Laser Safety BS60825

Issues

- Micro & Macro bends
- Dynamic Range
- Ghosts
- Gainers
- Dead zones
- Events
- Bandwidth Limitations, Dispersion, Attenuation

System testing procedures

Stage 1

A) Acceptance Testing

- Testing Optical fibre on the drum
- Internal & External Checks
- Length
- Attenuation Co-efficiency

Stage 1

B) Testing Laid Cable

- Testing of the fibre section
- Termination options for testing
- Loss testing
- Attenuation Co-efficiency
- Bending issues, Micro & Macro

Stage 2

Final Testing of complete system

- Termination options for testing
- Loss testing
- Bending issues, Micro & Macro
- Over sheath resistance testing
- Earthing & Bonding
- Checking Labels Identification i.e. Laser / Cable /Fibre
- Documentation & Schematics

PMD & CD Testing

- Length & Bandwidth Limitations
- Testing for PMD & CD
- How to minimise PMD & CD

Post Testing

- Schematics & Test Documentation
- Maintenance & Trouble shooting

FTTx Testing

- FTTx Considerations
- FTTx test equipment

Equipment

Standard Equipment

- Launch & Tail Leads
- Reference Leads Issues
- Single & Multi-mode fibre issues

BFA & Mechanical Splices

- Use of Bare Fibre Adapters for testing
- Correct uses of Mechanical Splices

Fibre Identifiers, Mandrels & Microscopes

- Correct uses & importance

Understanding Connectors & Adapters

- Type i.e. SC, FC/PC, MPx, LC & ST etc.
- Polish i.e. Flat, Angled, Super & Super Angled
- Faults. Assessing performance of Connector and Adapters

Visible Light Source (VFL) & Loss Test Set (ILM)

- Limitations & Uses
- Understanding the various ILM Kits
- Cutback methods
- Various Referencing methods
- Understanding correct uses
- Active Equipment Testing
- Results and Documentation

OTDR (Optical Time Domain Reflectometer)

- Understanding correct use
- Reflective & Non-Reflective Events
- Interpreting Results
- Fault Locating
- Launch & Tail Leads
- Results and Documentation
- OTDR Dynamic Range

Exam and Assessment Method

- Written Exam
- Practical Assessment



**Building
Partnerships**

Fibreplus Ltd.

Telecommunications College

Fujikura accredited and specialist courses

Fujikura Accredited courses:

Advanced Test & Measurement	3 or 5 days
Fibre Optic installation and testing. Single & Multimode, Internal/External.	5 days
Fibre/Copper Job cost and design	3 days

Specialist courses:

VOIP and the 3CX PBX System (Introduction)	1 day
VOIP and the 3CX PBX System (Advanced techniques)	3 days

The Fujikura accredited test & measurement course provides additional training for those who wish to increase their understanding or specialise in the field of Fibre Optic testing. Both 2 and 5 day courses covers testing techniques and the use of standard Fibre Optic test equipment (VLS/VFL, Light Source & Power Meter, and OTDR). In addition, the 5 day course includes time spent on chromatic and polarisation mode dispersion and FTTX testing.

Advanced Test & Measurement 3 day

The 3 day course covers these follow topics:

- Introduction to advanced testing & common terms used.
- Power & Loss budgets.
- Testing procedures:
 - i. Acceptance
 - ii. Installed cable
 - iii. Complete system
- Testing Equipment & Techniques:
 - i. VLS/VFL testing.
 - ii. ILM (Light source & Power Meter)
 - iii. OTDR Testing

Advanced Test & Measurement 5 day

The 5 day course covers these following topics:

- Introduction to advanced testing & common terms used.
- Power & Loss budgets.
- Testing procedures:
 - i. Acceptance
 - ii. Installed cable
 - iii. Complete system
- Testing Equipment & Techniques:
 - i. VLS/VFL testing.
 - ii. ILM (Light source & Power Meter)
 - iii. OTDR Testing
- Additional advanced testing content:
 - i. Chromatic Dispersion (CD)
 - ii. Polarisation Mode Dispersion (PMD).
 - iii. FTTX testing.

- Description:** This course covers all areas to include fault finding and commission fibre optic systems. This course is aimed at those who have a good understanding of fibre optics and wish to expand their knowledge and experience.
- Venue:** Main Fibreplus Ltd Training Centre: Westbury Wiltshire.
Centres: Westbury - Dunfermline - Peterborough - Lancaster - Surrey
- Prerequisite:** This course requires a good knowledge of fibre optic, please refer to our City & Guilds 3667-02 Qualification or Fibreplus Ltd accredited 5 day course to achieve the knowledge required to get the most from this course.
- Duration:** 3 days.
- Dates:** Available most weeks throughout the year, refer to Calendar and call for booking availability.
- Price:** Please refer to current price list. **FIBREPLUS PRICE GUARANTEE.** Not to be beaten on a like for like basis.

Introduction to advanced testing

Common Terms

- Wavelength, Frequency, dB Loss, dBm Power
- Fibres i.e. OM1, OM2 OM3 & OS1 G652 to G657
- Bandwidth Limitations, Dispersion, Attenuation
- Absorption and scattering, Electromagnetic Spectrum
- Optical Bands O, E, S, C, L & U

For FTTx testing, Chromatic and Polarisation Mode Dispersion (CD/PMD) please refer to the 5day Test & Measurement course

System testing procedures

Stage 1

A) Acceptance Testing

- Testing Optical fibre on the drum
- Internal & External Checks
- Length
- Attenuation Co-efficiency

Stage 1

B) Testing Laid Cable

- Testing of the fibre section
- Termination options for testing
- Loss testing
- Attenuation Co-efficiency
- Bending issues, Micro & Macro

Stage 2

Final Testing of complete system

- Termination options for testing
- Loss testing
- Bending issues, Micro & Macro
- Over sheath resistance testing
- Earthing & Bonding
- Checking Labels Identification i.e. Laser / Cable /Fibre
- Documentation & Schematics

Post Testing

- Schematics & Test Documentation
- Maintenance & Trouble shooting

Equipment

Standard Equipment

- Launch & Tail Leads
- Reference Leads Issues
- Single mode Multi-mode 50 & 62.5 fibre issues

BFA & Mechanical Splices

- Use of Bare Fibre Adapters for testing
- Correct uses of Mechanical Splices

Fibre Identifiers, Mandrels & Microscopes

- Correct uses & importance

Understanding Connectors & Adapters

- Type i.e. SC, FC/PC, MPx, LC & ST etc.
- Polish i.e. Flat, Angled, Super & Super Angled
- Faults. Assessing performance of Connector and Adapters

Visible Light Source (VFL) & Loss Test Set (ILM)

- Limitations & Uses
- Understanding the various ILM Kits
- Cutback methods
- Various Referencing methods
- Understanding correct uses
- Active Equipment Testing
- Results and Documentation

OTDR (Optical Time Domain Reflectometer)

- Understanding correct use
- Reflective & Non-Reflective Events
- Interpreting Results
- Fault Locating
- Launch & Tail Leads
- Results and Documentation
- OTDR Dynamic Range

Exam and Assessment Method

- 2 hour practical assessment

- Description:** This course covers all areas to include fault finding and commission fibre optic systems. This course is aimed at those who have a good understanding of fibre optics and wish to expand their knowledge and experience.
- Venue:** Main Fibreplus Ltd Training Centre: Westbury Wiltshire.
Centres: Westbury - Dunfermline - Peterborough - Lancaster - Surrey
- Prerequisite:** This course requires a good knowledge of fibre optic, please refer to our City & Guilds 3667-02 Qualification or Fibreplus Ltd accredited 5 day course to achieve the knowledge required to get the most from this course.
- Duration:** 5 days.
- Dates:** Available most weeks throughout the year, refer to Calendar and call for booking availability.
- Price:** Please refer to current price list. **FIBREPLUS PRICE GUARANTEE.** Not to be beaten on a like for like basis.

Introduction to advanced testing

Common Terms

- Wavelength, Frequency, dB Loss, dBm Power
- Fibres i.e. OM1, OM2 OM3 & OS1 G652 to G657
- Bandwidth Limitations, Dispersion, Attenuation
- Absorption and scattering, Electromagnetic Spectrum
- Optical Bands O, E, S, C, L & U

System testing procedures

Stage 1

A) Acceptance Testing

- Testing Optical fibre on the drum
- Internal & External Checks
- Length
- Attenuation Co-efficiency

PMD & CD Testing

- Testing for Length & Bandwidth Limitations

Stage 1

B) Testing Laid Cable

- Testing of the fibre section
- Termination options for testing
- Loss testing
- Attenuation Co-efficiency
- Bending issues, Micro & Macro

Post Testing

- Schematics & Test Documentation
- Maintenance & Trouble shooting

Stage 2

Final Testing of complete system

- Termination options for testing
- Loss testing
- Bending issues, Micro & Macro
- Over sheath resistance testing
- Earthing & Bonding
- Checking Labels Identification i.e. Laser / Cable /Fibre
- Documentation & Schematics

Equipment

Standard Equipment

- Launch & Tail Leads
- Reference Leads Issues
- Single mode Multi-mode 50 & 62.5 fibre issues

Understanding Connectors & Adapters

- Type i.e. SC, FC/PC, MPx, LC & ST etc.
- Polish i.e. Flat, Angled, Super & Super Angled
- Faults. Assessing performance of Connector and Adapters

BFA & Mechanical Splices

- Use of Bare Fibre Adapters for testing
- Correct uses of Mechanical Splices

Visible Light Source (VFL) & Loss Test Set (ILM)

- Limitations & Uses
- Understanding the various ILM Kits
- Cutback methods
- Various Referencing methods
- Understanding correct uses
- Active Equipment Testing
- Results and Documentation

Fibre Identifiers, Mandrels & Microscopes

- Correct uses & importance

OTDR (Optical Time Domain Reflectometer)

- Understanding correct use
- Reflective & Non-Reflective Events
- Interpreting Results
- Fault Locating
- Launch & Tail Leads
- Results and Documentation
- OTDR Dynamic Range

Exam and Assessment Method

- 2 hour practical assessment

Description: This course covers all areas of field maintenance for Fujikura fusion splicers. This course is aimed at those who will be using fusion splicers in the field and wish to get the most from their machines by ensuring it is operating at peak efficiency and by having the knowledge and understanding to recognise user issues and how to rectify them quickly and reduce unnecessary maintenance costs.

Venue: Main Fibreplus Ltd Training Centre: Westbury Wiltshire.

Centres: Westbury - Dunfermline - Peterborough - Lancaster - Surrey

Prerequisite: This course requires a knowledge of fibre optic splicers, please refer to our City & Guilds 3667-02 Qualification or Fibreplus Ltd accredited 5 day course to achieve the knowledge required to get the most from this course.

Duration: 1 day.

Dates: Available most weeks throughout the year, refer to Calendar and call for booking availability.

Price: Please refer to current price list. **FIBREPLUS PRICE GUARANTEE.** Not to be beaten on a like for like basis.

Introduction to fusion splicing

- How they work
- Various types
 - * Cladding Alignment
 - * Core to Core Alignment
- Benefits & Drawbacks

Introduction to Cleavers

- How they work
- Various types
 - * Precision
 - * Stapler
 - * Ultra sonic
 - * Angled
- Benefits & Drawbacks

Splicer setup procedures

- Splice menu settings
- Heater menu settings
- Calibration

Splicer User Procedures

- Fibre preparation
- Tools
- Cleaning
- Cleaving lengths
- Splice protector selection
- Fibre clamps

Common User Issues

- Splicer Issues
 - Too fat
 - Too thin
 - Bubble
 - Separation
 - Too Dusty
 - Large Dust Burned
 - High Loss
 - Offset fibres



- Cleaver Issues
 - * Large angles
 - * Dirty fibres
 - * Hackle/Burr
 - * Chips
- Cleave lengths



Maintenance & Service

Fusion Splicers

- Change electrodes
- Stabilise Electrodes
- Arc Calibration
- Cleaning
- Clamp Variations
- V-grooves
- Optics
- Maintenance checks
- Firmware updates



Cleavers

- Different types
- Cleaning
- Clamps
- V grooves
- Blade setting
- Blade replacement



Exam and Assessment Method

- Practical assessment

Description: An intensive "Fast Track" course designed to incorporate both Single/Multi-Mode test and installation of fibre optic cabling for applications including video, CCTV and data-coms. This course is ideal for executives looking for an accelerated course to obtain a better understanding of Single/Multi-Mode installation & testing practice, generally the same content as the City & Guilds without the additional costs and can be tailored to meet individual companies requirements.

On completion a **Fujikura Accreditation will be provided.**

Venue: Main Fibreplus Ltd Training Centre: Westbury Wiltshire.

Centres: Westbury - Dunfermline - Peterborough - Lancaster - Surrey

Duration: 5 days.

Dates: Available most weeks throughout the year, refer to Calendar and call for booking availability.

Price: Please refer to current price list. **FIBREPLUS PRICE GUARANTEE.** Not to be beaten on a like for like basis.

Introduction to Fibre Optics

Introduction

- Telecommunications
- Pros and cons of fibre optics
- Measurement units
- Components
- Bandwidth, Frequency & Wavelength

Safety

- BS.7671 recommendations
- Safe working practices
- Laser radiation and safety

Optical Fibres

- How fibre works
- Multi mode and Single mode
- Parameters of operation
- Refractive Index
- Emitters & Detectors

Installation

Fibre Types

- Multi/Single mode for internal/external installations
- OM1, OM2, OM3 & OS1, OS2
- G652, G653, etc

Cable Types

- Cable types, use and construction
- Loose Tube, & Tight Buffered
- Distribution & Breakout

Connectors

- Connectors basics and types
- Polishes i.e. Super, Flat, Angled and Super Angled
- Use of microscope and identifying issues
- Practical Workshop

Optical Splitters & Couplers

- WDM, DWDM & CWDM

Patch Panel & Distribution Boxes

- Optical Distribution Frames
- Distribution Boxes
- Breakout ~Boxes

Installation & Planning Considerations

- Procedures to European & International Standards
- ISO 11801
- BS EN 50174
- BS EN 60825

Cable Installation and Preparation

- Cable handling issues
- Techniques and tools

Joining of Fibre Optics

- Splice through and mid span
- Patch Panel components

Splicing

- Fusion splicing / Mechanical splicing
- Splicing - new developments
- Splicing pigtails v's direct connectorisation
- Cleaving
- Trouble shooting
- Splicing parameters
- Routine maintenance
- Arc Calibration

Testing

Test Equipment and Correct Procedures

- Using the VLS
- Setting up ILM Kit and referencing
- Light Source & Power Meter (ILM) Testing
- Workshop with Practical ILM Kit Use
- Understanding all Test equipment

- Understanding OTDR features and principles
- Event types i.e. Reflective and Non-Reflective
- Macro & Micro Bending explained
- Correct Fault Locating Principles

- Test Leads, Launch & Tail Leads
- OTDR Trace Analysis & Bi-Directional trace interpretation
- OTDR capability and limitation explained
- Workshop with Practical OTDR Use

Exam and Assessment Method

- Assessed written and practical exercises.

- Description:** For those undergoing training or those employed as installation technicians in the telecommunications and media network industry. Also beneficial for IT managers to give an insight to the problems that can arise when designing and installing a cable infrastructure. This course covers the integration of telecommunications (PBX's Analogue & Digital) within the structured cable system as well as design and cost consideration for internal and external installations.
- Venue:** Main Fibreplus Ltd Training Centre: Westbury Wiltshire.
Centres: Westbury - Dunfermline - Peterborough - Lancaster - Surrey
- Duration:** 3 days.
- Dates:** Available most weeks throughout the year, refer to Calendar and call for booking availability.
- Price:** Please refer to current price list. **FIBREPLUS PRICE GUARANTEE.** Not to be beaten on a like for like basis.

Course overview

Introduction:

- Common terms used
- Pros & Cons of copper. Fibre and wireless

Cable Type and Choice:

- Category or Class
- Copper Components & Equipment
- Coaxial, 1308, UTP, FTP, STP & Multi-pair
- Fibre i.e. Multi /Single Mode
- OM1, OM2, OM3 or OS1

Copper & Fibre installation:

- Correct Termination Methods
- Digital & Analogue Telco Patch choices
- Correct cable laying procedures
- Cable support and Containment
- Segregation Limitations
- Earth bonding
- Labelling & Documentation

Setting up copper test equipment:

- Standards
- NVP
- Shielded or UTP, Class or CAT, Channel or Fixed
- Copper Channel & Fixed / Permanent Link Tests

Design Criteria & Limitations:

- Distance & Bandwidth
- Security & Cost

European & International Standards:

- ISO 11801
- BS EN 50173
- TIA/EIA 568-A

Testing Copper & Fibre Cabling:

- Acceptance Testing
- Schematics
- OTDR Traces
- Loss Test Results
- Copper Test Reports
- Copper Tests i.e. Next, Crosstalk & ACR etc.
- Earth Impedance Check and Report
- Fault Finding

Safety & Permission issues:

- Hazards & Regulations
- Building Grade & Permissions
- Fire stopping/moisture sealing

Copper Termination issues:

- 568A or 568B
- Shielding issues
- IDC type. Krone, 110 or Block 66
- Correct use of tooling for connectors

Tester overview:

- Tone & Oscillators
- Wiremapper
- Certification Testers .e.g. Fluke, Meggar, Omni scanner
- Fibre Optic test equipment:
 - Visual Light Source
 - Light Source & Power Meter
 - OTDR

Exam and Assessment Method

- Written & practical assessment.



Main Training Centre

Fibreplus Ltd. Unit 1 - 4 Brook Lane,
Westbury, Wiltshire. BA13 4ES
Tel:- 01225 636041 email:-enq@fibreplus.co.uk

Voice Over IP (VOIP) & Introduction to 3CX PBX System 1,2&3 day courses



Break free from you old PBS and telephone wiring with the power of VOIP.

With the roll out of FTTX gathering pace, the increased bandwidth is making available a whole host of new services, including VOIP.

VOIP ,or Voice Over IP, allows external phone calls to be made at a minimal cost by using the Ethernet instead of the more traditional plain old telephone service (POTS), while internally the management of individual phones, extensions and groups couldn't be easier with the software installed on a designated pc providing the functions of the PBX. VOIP is a perfect solution for reducing costs in a business environment where a high volume of long distance or conference calls are being made, between office locations for example, or where a large amount of extensions and groups can be difficult to manage, a call centre for example.

- This course is designed for people with basic IT skills, although it is recommend that beginners should complete the 1 day unit 1 introduction before attempting unit 2.
- Ideal for network engineers or IT managers looking for ways to lower their telecommunications costs.
- Each unit can be completed separately or combined over 3 days.
- At the end of the 3 days students will have at least a basic understanding of VOIP and be able to use and configure the 3CX PBX System.

Unit 1 Introduction to VOIP & 3CX PBX system. 1 Day

This unit covers the basics of VOIP and the 3CX PBX System .

- Introduction to VOIP
- Introduction to the 3CX PBX System
- Installation & basic operation of the 3CX PBX

Unit2 Advanced Techniques. 2 Day

This unit covers the advanced features of the 3CX PBX including:

- Automatic provisioning
- Remote extensions
- Configuring PSTN line
- Call Conferencing
- Ring Groups & Digital Receptionist
- Monitoring & trouble shooting

VOIP Telephony Utilising 3CX PBX System

Unit 1 Basic understanding

- Description:** This one day introduction to VOIP (Voice Over IP) covers the basics of using VOIP and includes a overview of the 3CX PBX system.
- Venue:** Main Fibreplus Ltd Training Centre: Westbury Wiltshire.
Centres: Westbury - Dunfermline - Peterborough - Lancaster - Surrey
- Duration:** 1 Day.
- Dates:** Available most weeks throughout the year, refer to Calendar and call for booking availability.
- Price:** Please refer to current price list. **FIBREPLUS PRICE GUARANTEE.** Not to be beaten on a like for like basis.
- Pre-requisite:** Basic IT skills.

Introduction to VOIP

Introduction to VOIP:

- What is VOIP
- How does it work
- Encoding
- Benefits of VOIP

SIP Phones:

- Hard phones
- Soft phones
- Analogue phones
- Versions

Introduction to 3CX

Introduction to 3CX system for Windows:

- What is 3CX
- Components

Installing 3CX:

- Requirements
- Setup
- Configuration Wizard
- Upgrading 3CX
- Activating
- Firewall Configuration

Creating Extensions:

- Introduction
- Adding extensions
- User and authentication information
- Voicemail options

Basic Provisioning of Phones:

- Configuring SIP phones
- Importing Extensions
- Testing
- Provisioning
- Monitoring

Configuring VOIP lines:

- Introduction
- Requirements:
 - Create an account
 - Add provider account to 3CX
- Specify a STUN server
- DDI's and VOIP

Configuring Basic Call rules:

- Introduction
- Creating outbound rules
- Creating Inbound rules

Call reports:

- Introduction
- Reports available
- Generating call reports

Phonebook:

- Company phone book
- Personal phonebook
- Importing phonebook entries
- Using the phonebook

Introduction to Advanced Features:

- PSTN line integration

FXO/FXS:

- Bridging
- Remote extensions
- Conference calls
- Fax

How to Backup and Restore:

- Introduction
- How to backup and restore
- Scheduling regular backups



Exam and Assessment Method

- Assessed practical exercises.

Main Training Centre

Fibreplus Ltd. Unit 1 - 4 Brook Lane,
Westbury, Wiltshire. BA13 4ES

Tel:- 01225 636041 email:-enq@fibreplus.co.uk

VOIP Telephony Utilising 3CX PBX System

Unit 2 Advanced understanding

- Description:** This two day course follows on from the 1 day basic introduction to VOIP. These additional two days will cover the more advanced features for using the 3CX PBX system and a more in depth view into VOIP and the related technologies.
- Venue:** Main Fibreplus Ltd Training Centre: Westbury Wiltshire.
Centres: Westbury - Dunfermline - Peterborough - Lancaster - Surrey
- Duration:** 2 Days.
- Dates:** Available most weeks throughout the year, refer to Calendar and call for booking availability.
- Price:** Please refer to current price list. **FIBREPLUS PRICE GUARANTEE.** Not to be beaten on a like for like basis.
- Pre-requisite:** Completion of the 1 day introduction to VOIP course or previous VOIP experience required.

Course Overview

Automatic Provisioning:

- How provisioning works
- Configuring extensions for provisioning
- Configure phone to receive configuration
- Provisioning via phones web interface
- Provisioning via DHCP option 66
- Provisioning URL
- URL format for each phone
- Provisioning templates
- Re-provisioning
- Monitoring your IP phones

Digital receptionist:

- Introduction
- Recording a menu prompt
- Creating a digital receptionist
- Allowing callers to dial a known extension directly
- Call by name
 - i. Self identification message
 - ii. How it works

Ring Groups and Queues:

- Ring groups
- Paging/Intercom
- Call queues

Remote extensions:

- Introduction
- How it works
- Configuring the tunnel

Monitoring & Troubleshooting:

- Introduction
- Things to monitor

Configuring PSTN Lines:

- Introduction
- What is a VOIP gateway
- PSTN line configuration
- Generating a configuration file
- Configuring the PSTN interface

Forwarding Rules:

- What are forwarding rules
- Simple rules interface
- Advanced call forwarding interface

Call conferencing:

- Enabling conferencing
- Creating a call conference

Configuring the phone:

- Using the tunnel with IP hard phones

Monitor IP of gateways and phone system:

- Manual
- Configuration guides
- Wiki
- Request support via vendor or 3CX support.

Adding DDI:

- Introduction
- How DDI work in 3CX
- Adding DDI
- Using DDI with a VOIP provider account
- Troubleshooting
- Calling a party on the other 3CX system

3CX Assistant:

- Introduction
- Installing 3CX Assistant
- Configuring 3CX Assistant for use with Outlook

Creating a Bridge:

- Introduction
- Connecting 3CX phone systems

Fax Server:

- Introduction
- Fax receiving configuration
- Fax server credentials

Additional Information:

- Configuring the PBX and firewall.
- Systems extension
- 3CX services
- Windows events

Exam and Assessment Method

- Assessed practical and written exercises.

- Description:** This course provides all the required training for people wishing to understand and install intelligent home systems from street level (FTTx) to the set up and integration of POE and VOIP systems.
- Venue:** Main Fibreplus Ltd Training Centre: Westbury Wiltshire.
Centres: Westbury - Dunfermline - Peterborough - Lancaster - Surrey
- Duration:** 5 days
- Dates:** Available most weeks throughout the year, refer to Calendar and call for booking availability.
- Price:** Please refer to current price list. **FIBREPLUS PRICE GUARANTEE.** Not to be beaten on a like for like basis.

Course overview

Introduction:

- Concept of Intelligent Homes
- Common terms used
- Pros & Cons of copper. Fibre and wireless

Cable Type and Choice:

- Category or Class
- Copper Components & Equipment
- Coaxial, 1308, UTP, FTP, STP & Multi-pair
- Fibre i.e. Multi /Single Mode
- OM1, OM2, OM3, OM4 or OS1/2

Fibre termination issues:

- Connector e.g. contamination, misalignment
- Connect choices and polishes
- Field Installable Connectors FTTx & in-house
- Cleaving issues
- Splicing issues
- Equipment Setup

Test equipment overview:

- Schematics & Drawings
- Tone & Oscillators
- Wire mapper
- Certification Testers .e.g. Fluke, Meggar, Omni scanner
- Fibre Optic test equipment:
 - Visual Light Source
 - Fibre Identifier
 - Fibre Certification Tools
 - Light Source & Power Meter
 - OTDR

PoE Power over Ethernet systems:

- System Basics
- Door Access
- CCTV
- Intruder
- Heating, Ventilation, Lighting etc.
- PoE Injectors

Design Criteria & Limitations:

- Distance & Bandwidth
- Security & Cost
- Cable Types Copper, Fibre and variations
- Loss Budget & Power Budgets

European & International Standards:

- ISO 11801
- BS EN 50173 /50174
- TIA/EIA 568-A
- PoE Standards

FTTx installation methods:

- Duct & Micro Ducting
- Riser systems
- Drop Cable
- Low friction uses
- Micro Cable & Fibre Bundle variations

FTTx:

- PON Variants & Performance
- "Point to Point & "Point to Multi-Point"
- Understanding of ONU, OLT
- Understanding of couplers and splitters
- Aerial, underground & slotting methods
- Architecture of various PON & Point 2 Point systems
- FTTx System Design, loss and power budgets.
- Commissioning, testing and fault analysis of FTTx systems
- FTTx enclosure & ODF's explained .

Commissioning & Configuring networked Intelligent building systems:

- Integration of AV systems. E.g. RF, analogue, digital.
- Active equipment including media converts
- Understanding switches, VLAN & Tagging
- Installing and commissioning routers

Safety & Permission issues:

- Hazards & Regulations
- Building Grade & Permissions
- Fire stopping/moisture sealing

Copper Termination issues:

- 568A or 568B
- Shielding issues
- IDC type. Krone, 110 or Block 66
- Correct use of tooling for connectors

Testing Copper :

- Copper Test Reports
- Copper Tests i.e. Next, Crosstalk & ACR etc.
- Earth Impedance Check and Report
- Fault Finding

VOIP:

- System Basics
- Integrating POE
- SIP and STUN servers
- Gateways
- FXO & FXS ~Explained
- Port tunnelling & Bridging
- PSTN integration
- Call Groups and Forwards
- Out Worker/Remote Office Setup
- Auto Attendant